State of New Jersey

Department of Transportation

GENERAL DESIGN CRITERIA AND STANDARD DRAWINGS FOR OVERHEAD AND CANTILEVER SIGN SUPPORT STRUCTURES

2002

(U.S. Customary English Units)

GENERAL NOTES

A. DESIGN CRITERIA

DESIGN SPECIFICATIONS

1996 AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES (16TH EDITION) AS MODIFIED BY SECTION 3 AND SECTION 32 OF THE CURRENT NJDOT DESIGN MANUAL - BRIDGES AND STRUCTURES, AND 1994 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS.

DESIGN LOADS

DESIGN WIND VELOCITY ---- 80 MPH
DESIGN ICE LOAD ----------- 3 PSF

SEISMIC LOADS FOR SEISMIC PERFORMANCE CATEGORY (SPC) B, A=0.18, SOIL PROFILE IV (REF. 1996 AASHTO, DIVISION 1A).

FATIGUE LOADS

ALL STRUCTURAL DETAILS HAVE BEEN DESIGNED FOR FATIGUE RESISTANCE UNDER THE FOLLOWING FATIGUE LOADS:

1) NATURAL WIND GUSTS: P_{nw} = 5.2Cd (PSF),
WHERE Cd IS THE DRAG COEFFICIENT SPECIFIED IN SECTION 1.2.5 OF THE 1994 STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS. NATURAL WIND GUST PRESSURE RANGE APPLIED IN THE HORIZONTAL DIRECTION TO THE AREA PROJECTED ON A VERTICAL PLANE OF ALL SUPPORT STRUCTURE MEMBERS, SIGN PANELS AND WALKWAYS.

2) TRUCK-INDUCED GUSTS: P_{tg} = 36.6Cd (PSF),
WHERE Cd IS THE DRAG COEFFICIENT SPECIFIED IN SECTION 1.2.5 OF THE 1994 STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS. TRUCK GUST PRESSURE RANGE APPLIED IN THE UPWARD VERTICAL DIRECTION ALONG THE FULL LENGTH OF THE TRUSS SPAN TO THE AREA PROJECTED ON A HORIZONTAL PLANE OF ALL SUPPORT STRUCTURE MEMBERS, SIGN PANELS, AND WALKWAYS.

VARIABLE MESSAGE SIGN (VMS) STRUCTURES

REFER TO SECTION 32 OF THE NJDOT DESIGN MANUAL - BRIDGES AND STRUCTURES WHEN FURNISHING SUPPORT STRUCTURES FOR VARIABLE MESSAGE SIGNS (VMS).

CONCRETE DESIGN STRESSES

SPECIFIED COMPRESSIVE STRENGTH (f'c) (CLASS B) ---- 3,000 PSI
EXTREME FIBER COMPRESSIVE STRESS (fc) ----------- 1,200 PSI

REINFORCEMENT STEEL DESIGN STRESS

TENSILE STRESS (fs) (A615, GRADE 60) ---- 24 KSI

STRUCTURAL STEEL DESIGN STRENGTHS

YIELD STRENGTH (Fy)
PIPES (A53, TYPE S OR TYPE E, GRADE B) ---- 35 KSI (MIN.)
---- 51 KSI (MAX.)

FOUNDATIONS

MAXIMUM FOUNDATION BEARING PRESSURE ---- 2.5 KSF
FOOTINGS ARE DESIGNED SUCH THAT A MINIMUM OF 75 PERCENT OF THE FOOTING IS ALWAYS IN CONTACT; A MAXIMUM OF 25 PERCENT OF THE FOOTING IS IN UPLIFT.

BEARING PILES SHALL BE CAST-IN-PLACE CONCRETE PILES WITH A MINIMUM BEARING CAPACITY EQUAL TO 50 KIPS.

CAMBER

PERMANENT CAMBER EQUAL TO L/1000 HAS BEEN PROVIDED IN ADDITION TO THE DEAD LOAD CAMBER.

B. MATERIALS

I. STEEL

STEEL PIPE SHALL BE CERTIFIED BY MILL TEST REPORT TO MEET ASTM SPECIFICATION A53, TYPE E OR S, GRADE B WITH THE EXCEPTION THAT API 5L, GRADE B MAY BE USED WHEN THE SPECIFIED WALL THICKNESS IS GREATER THAN ½". ONLY ELECTRICAL RESISTANCE WELDED (ERW) MANUFACTURED SINGLE SEAM PIPE IS PERMITTED. HOWEVER, WHEN THE REQUIRED PIPE SIZE IS GREATER THAN 24", DOUBLE SEAM PIPE MAY BE USED. A MILL TEST REPORT MUST BE PROVIDED, CERTIFIED AND SIGNED BY THE PIPE MANUFACTURER, CONTAINING PHYSICAL AND CHEMICAL PROPERTIES AND THE MANUFACTURING PROCESS USED TO PRODUCE THE PIPE.

ALL OTHER STEEL SHALL CONFORM TO ASTM SPECIFICATION A36 GRADE 36 OR AASHTO M270 GRADE 50 (ASTM A709). ALL THIS SPECIFICATION STEEL SHALL MEET SUPPLEMENTARY REQUIREMENTS FOR NOTCH TOUGHNESS (CHARPY TESTING, ZONE #2)

REFER TO SUBSECTION 509.02 OF THE NJDOT STANDARD SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

UPON COMPLETION OF FABRICATION, THE FABRICATOR SHALL PROVIDE A NOTARIZED CERTIFICATION OF COMPLIANCE AS PER SECTION 106.04 OF THE NJDOT STANDARD SPECIFICATIONS, INCLUDING A LEGIBLE COPY OF ALL MILL TEST REPORTS FOR MATERIALS INCORPORATED INTO THE WORK.

STEEL ANCHOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM SPECIFICATION F1554, GRADE 36. THE ANCHOR BOLTS SHALL BE HOT DIP GALVANIZED AS PER ASTM SPECIFICATION A153, CLASS C.

CHORD SPLICE ASSEMBLY FASTENERS SHALL BE HIGH STRENGTH STEEL CONFORMING TO ASTM SPECIFICATION A325 AND SHALL BE HOT DIP GALVANIZED AS PER ASTM SPECIFICATION A153, CLASS C. ALL OTHER FASTENERS SHALL BE STAINLESS STEEL CONFORMING TO ASTM SPECIFICATION A320, GRADE B8, CLASS 1.

CAPS FOR THE ENDS OF CHORDS AND TOPS OF POSTS SHALL BE STEEL CONFORMING TO ASTM SPECIFICATION A36 AND SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM SPECIFICATION A123.

WELDING OF STEEL SHALL BE AS SPECIFIED IN THE CONSTRUCTION SPECIFICATIONS.

AFTER COMPLETE FABRICATION, EACH STEEL SECTION SHALL BE HOT DIP GALVANIZED ACCORDING TO THE REQUIREMENTS OF ASTM SPECIFICATION A123, AS MODIFIED BY THE CONSTRUCTION SPECIFICATIONS. A SINGLE DIP GALVANIZING PROCESS IS PREFERRED IF SIZE PERMITS.

II. ALUMINUM

ALUMINUM SHALL CONFORM TO THE ASTM SPECIFICATIONS AND ALLOYS LISTED BELOW:

APPLICATION	ASTM SPECIFICATION	ASTM ALLOY
ROLLED OR EXTRUDED SHAPES	B308	6061 - T6
PLATES	B209	6061 - T6
DRAWN SEAMLESS TUBES	B210	6061 - T6
EXTRUDED TUBES	B221	6061 - T6

WELDING OF ALUMINUM SHALL BE AS SPECIFIED IN THE CONSTRUCTION SPECIFICATIONS.

III. REINFORCEMENT STEEL

ALL REINFORCEMENT STEEL SHALL BE ASTM A615, GRADE 60.

IV. CONCRETE

ALL CONCRETE SHALL BE "CONCRETE IN STRUCTURES, FOOTINGS", UNLESS OTHERWISE SPECIFIED BY THE DESIGNER.

V. SIGN LIGHTING

WHEN NECESSARY, AN APPROVED SIGN LIGHTING SYSTEM MAY BE USED AND THE DETAILS OF THE SYSTEM SHALL BE PROVIDED. NJDOT TRAFFIC SIGNAL AND SAFETY ENGINEERING SHOULD BE CONTACTED FOR REQUIREMENTS REGARDING THE PROVISION OF SIGN LIGHTING OR REFLECTORIZED SIGN PANELS.

VI MAINTENANCE WALKWAY

THE PROVISION OF MAINTENANCE WALKWAYS IS NOT REQUIRED. THE MAINTENANCE WALKWAY DETAIL SHEET SHALL BE EXCLUDED FROM SIGN STRUCTURE DRAWINGS WHEN WALKWAY IS NOT PROVIDED. IF THE WALKWAY IS PROVIDED, ADD THE FOLLOWING TO THE GENERAL NOTES OF THE SIGN STRUCTURE DRG. OH-D1. "MAINTENANCE WALKWAYS AND LUMINAIRE SUPPORTS SHALL BE ALUMINUM. SIGN HANGERS SHALL BE ALUMINUM OR STEEL. STEEL SURFACES SHALL BE PREVENTED FROM COMING INTO CONTACT WITH ALUMINUM SURFACES BY MEANS OF APPROVED PADS OR A PROTECTIVE COATING PLACED BETWEEN THE DISSIMILAR METALS. PADS SHALL BE STAINLESS STEEL CONFORMING TO ASTM SPECIFICATION A240, TYPE 304 OR APPROVED EQUAL."

INSTRUCTIONS FOR DESIGNERS

STEP #1: PREPARE A SIGN SUPPORT LOCATION PLAN AND ELEVATION VIEW FOR EACH STRUCTURE.

STEP #2: ENTER THE SIGN SUPPORT NUMBER AND STATION IN THE SCHEDULE OF STRUCTURES ON SIGN STRUCTURE DRG. OH-D2 OF THE CONTRACT PLANS.

STEP #3: DETERMINE THE TRUSS SPAN LENGTH AND HEIGHT OF THE STRUCTURE USING SIGN STRUCTURE DRG. OH-G2. RECORD THE ACTUAL TRUSS SPAN LENGTH IN THE SCHEDULE OF STRUCTURES ON SIGN STRUCTURE DRG. OH-D2 OF THE CONTRACT PLANS. ROUND THIS NUMBER TO THE NEXT HIGHER LISTED SPAN LENGTH. IF THE TRUSS SPAN LENGTH IS OVER 165'-0", PROCEED TO STEP #17.

STEP #4: DETERMINE THE SIGN DESIGN LENGTH USING SIGN STRUCTURE DRG. OH-G2. DIVIDE THE SIGN DESIGN LENGTH BY THE TRUSS SPAN LENGTH DETERMINED IN STEP #3 TO OBTAIN THE PERCENT SIGN DESIGN LENGTH. USE THE NEXT HIGHER PERCENT FROM THOSE LISTED (40%, 60%, 70%, OR 80%). IF THE PERCENT IS MORE THAN 80, PROCEED TO STEP #5. OTHERWISE, SKIP TO STEP #6.

STEP #5: TO SELECT A STANDARD DESIGN, DIVIDE THE SIGN DESIGN LENGTH BY 80% AND ROUND THIS NUMBER TO THE NEXT HIGHER LISTED SPAN LENGTH. IF THE NUMBER IS LESS THAN 165'-0", RETURN TO STEP #4. OTHERWISE, PROCEED TO STEP #17.

STEP #6: HAVING OBTAINED THE TRUSS SPAN LENGTH (FROM STEP #3 OR STEP #5) AND THE PERCENT SIGN DESIGN LENGTH (FROM STEP #4), SELECT THE TRUSS SIZE AND THE TRUSS ELEMENT SIZES (I.E., CHORDS, DIAGONALS, AND STRUTS) USING THE APPROPRIATE DESIGN TABLES ON SIGN STRUCTURE DRGS. OH-G3 AND OH-G4. RECORD THE DATA IN THE SCHEDULE OF STRUCTURES ON SIGN STRUCTURE DRGS. OH-D2 OF THE CONTRACT PLANS.

STEP #7: WITH THE TRUSS SPAN LENGTH KNOWN, DETERMINE THE MAXIMUM CAMBER REQUIRED FOR THE TRUSS FROM THE CAMBER TABLE SHOWN ON SIGN STRUCTURE DRG. OH-G3. RECORD THIS CAMBER IN THE SCHEDULE OF STRUCTURES ON SIGN STRUCTURE DRG. OH-D2 OF THE CONTRACT DRAWINGS.

STEP #8: WITH THE HEIGHT OF THE STRUCTURE OBTAINED IN STEP #3 AND USING THE ELEVATION OF THE BOTTOM OF BASE PLATE, DETERMINE THE ELEVATION OF THE CENTER LINE OF THE TRUSS AND THE DESIGN HEIGHT OF THE TOWERS. IF THE TOWERS ARE MORE THAN 40'-0", SKIP TO STEP #17. OTHERWISE, SELECT THE NEXT HIGHER NUMBER FROM THOSE LISTED (25, 30, OR 40 FEET). USING THE SAME TABLE USED IN STEP #6, SELECT THE SIZES OF THE TOWER ELEMENTS (I.E., SHAFTS, DIAGONALS, AND STRUTS). RECORD THE DATA IN THE SCHEDULE OF STRUCTURES ON SIGN STRUCTURE DRG. OH-D2 OF THE CONTRACT DRAWINGS.

STEP #9: CHECK AVAILABILITY OF SHAPES SELECTED IN STEPS #6 AND #8.

STEP #10: USING SOIL TEST AND SOIL BORING INFORMATION, DETERMINE THE ALLOWABLE SOIL PRESSURE AND THE REQUIRED DEPTH OF FOOTINGS.

STEP #11: DETERMINE THE PEDESTAL HEIGHT. IF THE PEDESTAL HEIGHT IS BETWEEN 4'-0" AND 6'-0", PROCEED TO STEP #12. OTHERWISE, SKIP TO STEP #17. THE PREFERRED PEDESTAL HEIGHT OF 4'-6" IS TO BE USED WHENEVER POSSIBLE. WHEN USING A BARRIER PEDESTAL, THE "COVERED" HEIGHT MUST BE 3'-0". OTHERWISE, SKIP TO STEP # 17

STEP #12: DETERMINE THE REQUIRED FOOTING SIZES USING THE DESIGN TABLES ON SIGN STRUCTURE DRGS. OH-G3 AND OH-G4. RECORD THE DATA IN THE SIGN SUPPORT FOUNDATION TABLE ON SIGN STRUCTURE DRG. OH-D3 OF THE CONTRACT PLANS.

STEP #13: DETERMINE THE REQUIRED FOOTING DESIGN DATA USING SIGN STRUCTURE DRG. OH-G6. RECORD THIS DATA IN THE SIGN SUPPORT FOUNDATION TABLE ON SIGN STRUCTURE DRG. OH-D3 OF THE CONTRACT PLANS. IF THE ALLOWABLE SOIL PRESSURE IS GREATER THAN 2.5 KSF, SKIP TO STEP #15. OTHERWISE, PROCEED TO STEP #14.

STEP #14: SELECT THE NUMBER OF CAST-IN-PLACE CONCRETE PILES NEEDED TO SUPPORT THE STRUCTURE USING SIGN STRUCTURE DRG. OH-G6. RECORD THE DATA IN THE SIGN SUPPORT FOUNDATION TABLE ON SIGN STRUCTURE DRG. OH-D3 OF THE CONTRACT PLANS.

STEP #15: DETERMINE WHETHER A PEDESTAL OR BARRIER PEDESTAL IS TO BE USED FOR THE FOUNDATION. SELECT ALL PEDESTAL OR BARRIER PEDESTAL DATA FROM SIGN STRUCTURE DRG. OH-G5. RECORD THE DATA IN THE SIGN SUPPORT FOUNDATION TABLE ON SIGN STRUCTURE DRG. OH-D3 OF THE CONTRACT PLANS.

STEP #16: THE DESIGN OF THE OVERHEAD SIGN SUPPORT STRUCTURE IS COMPLETE. DISREGARD STEP #17.

STEP #17: THE PARAMETERS OF THE SIGN SUPPORT STRUCTURE EXCEED THE RESTRICTIONS RELATED TO THESE STANDARD DESIGN TABLES. DESIGN THE SIGN SUPPORT STRUCTURE ON AN INDIVIDUAL BASIS.

INDEX OF DRAWINGS

THIS PLATE FOR DESIGN INFORMATION ONLY.
DO NOT INCLUDE IN CONTRACT PLANS.

SIGN STRUCTURE DRG. OH-G1

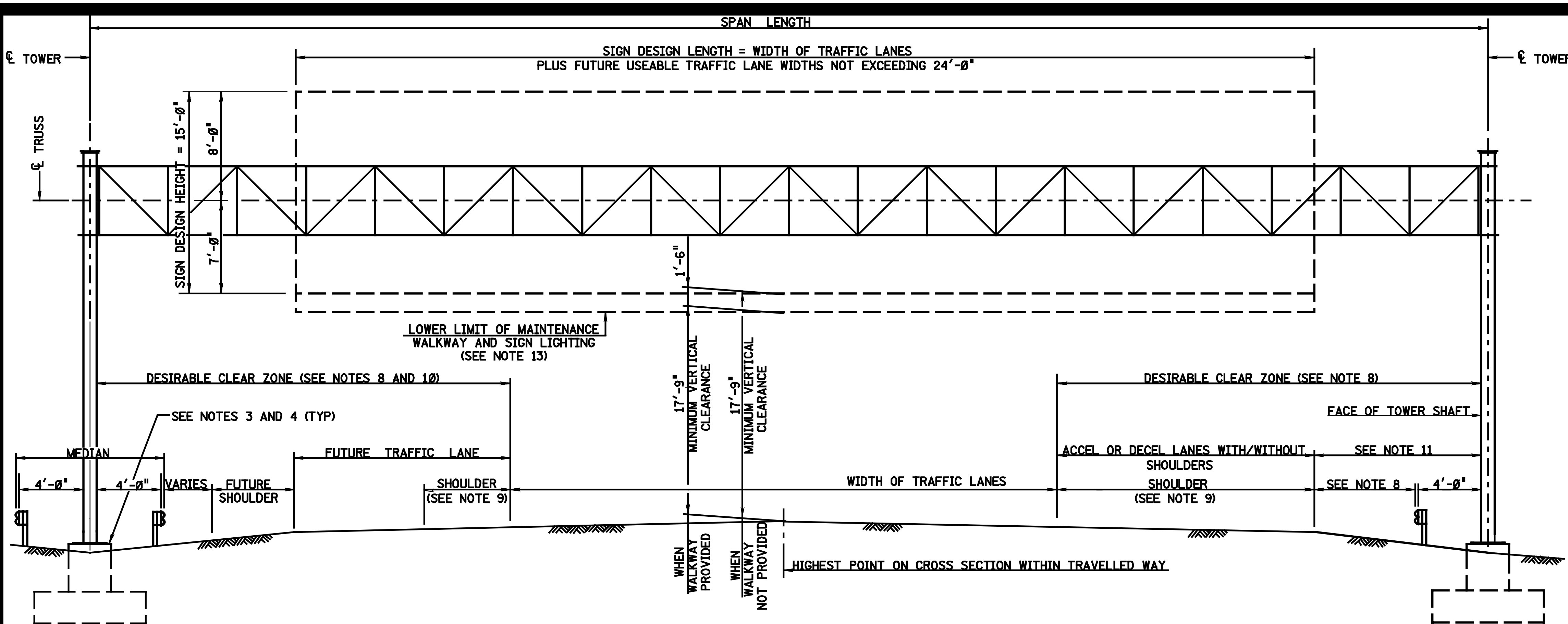
NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

OVERHEAD SIGN SUPPORT STANDARDS

GENERAL INFORMATION

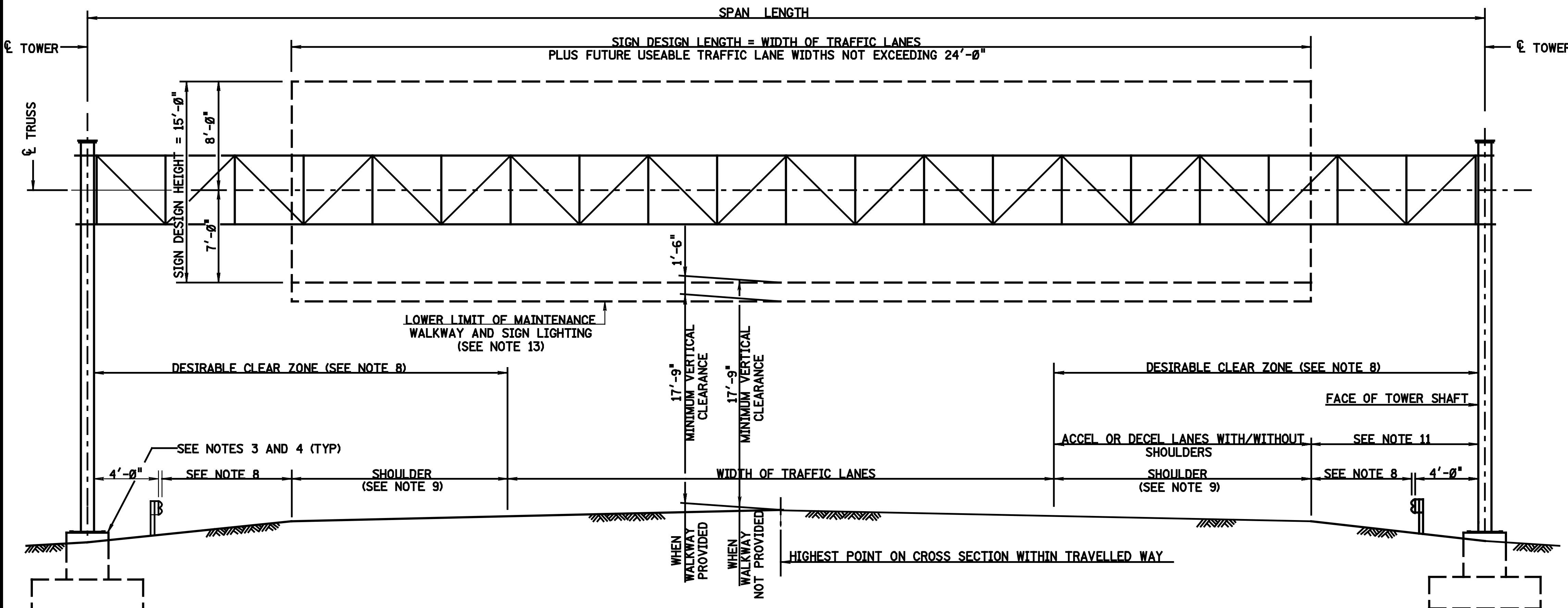
SCALE : NONE

BDC02D-03 - ORIGINAL SHEET



OVERHEAD SIGN STRUCTURE

DIVIDED HIGHWAY SYSTEMS



OVERHEAD SIGN STRUCTURE

NONDIVIDED HIGHWAY SYSTEM AND RAMPS

NOTES:

1. THE BOTTOM EDGE OF ALL SIGN PANELS SHALL BE LEVEL AND AT THE SAME ELEVATION.
2. THE TOP EDGE OF ALL SIGN PANELS SHALL PROJECT NOT LESS THAN 6" ABOVE THE TOP OF THE TOP CHORD. THE SIGN PANEL SIZES AND LOCATIONS SHALL BE VERIFIED AND APPROVED BY THE DESIGNER.
3. TOP OF PEDESTALS SHALL BE SET 4" ABOVE THE FINISHED GROUND LINE.
4. THE ELEVATION OF THE BOTTOM OF THE TOWER SHAFT BASE PLATES SHALL BE SET AT (ANCHOR BOLT DIA. + 1") ABOVE TOP OF PEDESTAL OR TOP OF BARRIER PEDESTAL (SEE SIGN STRUCTURE DRG. OH-D8).
5. THE TRUSS SHALL BE A FOUR-CHORD, BOX SHAPED TRUSS.
6. IF REQUIRED, MAINTENANCE WALKWAY, RAILING AND LUMINAIRE SUPPORTS SHALL BE PROVIDED CONTINUOUSLY FOR THE ENTIRE SIGN DESIGN LENGTH. THE NEED FOR MAINTENANCE WALKWAY RAILING AND LUMINAIRE SUPPORTS SHALL BE VERIFIED AS PART OF THE PRELIMINARY SUBMISSION.
7. IF THE TOWER FOUNDATION IS WITHIN THE CLEAR ZONE, IT SHALL BE PROTECTED BY GUIDE RAIL, BARRIER OR OTHER SUITABLE MEANS, DEPENDING ON SITE CONDITIONS.
8. SEE NJDOT ROADWAY DESIGN MANUAL FOR CLEAR ZONE CRITERIA AND FOR GUIDE RAIL OFFSET CRITERIA.
9. SHOULDER IS NOT TO BE INCLUDED IN THE SIGN DESIGN LENGTH UNLESS THE SHOULDER IS WITHIN AN AREA PRESCRIBED AS A FUTURE USEABLE TRAFFIC LANE.
10. IF MEDIAN IS LESS THAN 5'-0" WIDE, PLACE THE CENTERLINE OF TOWER AT THE CENTERLINE OF MEDIAN.
11. THIS DIMENSION SHALL NOT BE LESS THAN 1'-0" GREATER THAN THE MINIMUM CLEARANCE REQUIRED FOR OVERPASS STRUCTURES.
12. LEFT AND RIGHT TOWERS ARE DEFINED LOOKING UPSTATION.
13. WHEN MAINTENANCE WALKWAY IS NOT PROVIDED, THE 17'-9" VERTICAL UNDERCLEARANCE SHALL BE PROVIDED TO THE BOTTOM OF SIGN LIGHTING. THE WALKWAY RELATED DETAILS SHALL BE EXCLUDED FROM THE SIGN STRUCTURE PLANS.

THIS PLATE FOR DESIGN INFORMATION ONLY.
DO NOT INCLUDE IN CONTRACT PLANS.

SIGN STRUCTURE DRG. OH-G2

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

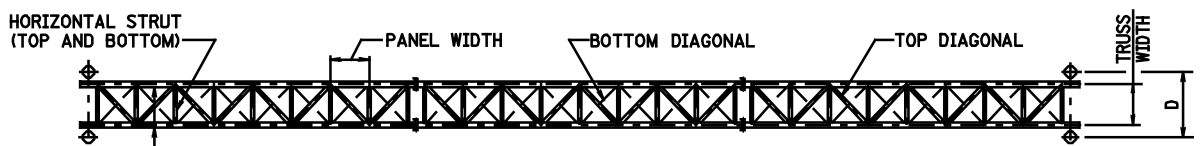
OVERHEAD SIGN SUPPORT STANDARDS

GENERAL CRITERIA

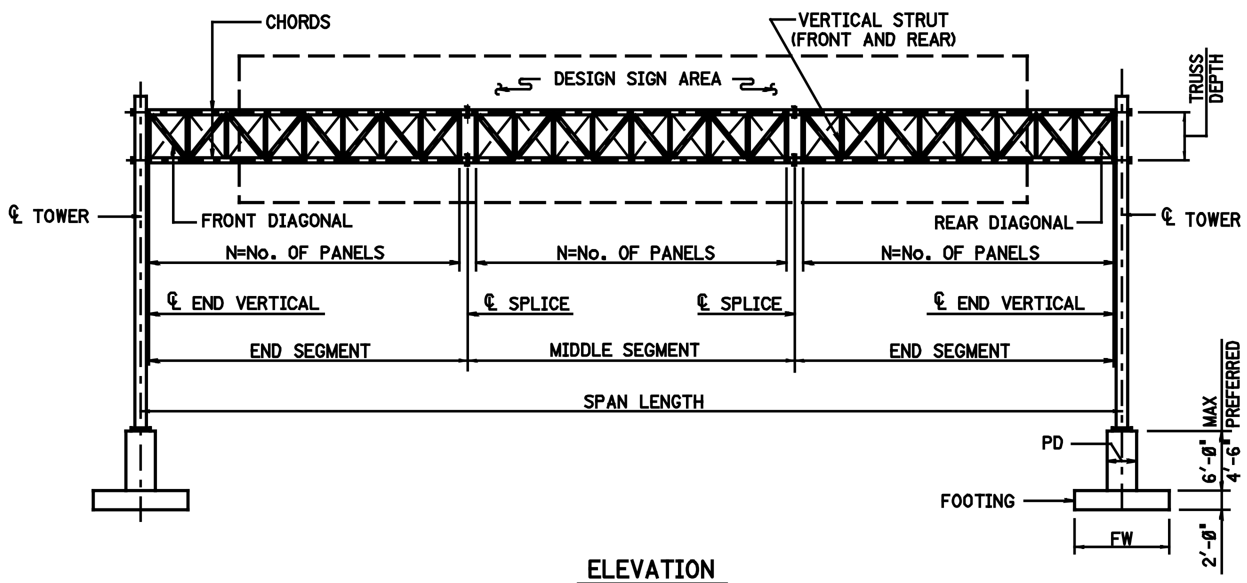
SCALE : NONE

SPAN LENGTH (FT)	SIGN LENGTH (')	TRUSS SIZE	TRUSS MEMBERS: CHORDS O.D.xTHICK (IN)	TRUSS MEMBERS: DIAGONALS O.D.xTHICK (IN)	TRUSS MEMBERS: STRUTS O.D.xTHICK (IN)	TRUSS MEMBERS: END STRUTS O.D.xTHICK (IN)	TOWER MEMBERS H = 25 FT: SHAFT O.D.xTHICK (IN)	TOWER MEMBERS H = 25 FT: DIAGONAL O.D.xTHICK (IN)	TOWER MEMBERS H = 30 FT: SHAFT O.D.xTHICK (IN)	TOWER MEMBERS H = 30 FT: DIAGONAL O.D.xTHICK (IN)	TOWER MEMBERS H = 40 FT: SHAFT O.D.xTHICK (IN)	TOWER MEMBERS H = 40 FT: DIAGONAL O.D.xTHICK (IN)	TOWER MEMBERS: STRUTS O.D.xTHICK (IN)
45	40	4' (WIDTH) x 4' (DEPTH)	3.500 x .216	2.875 x .203	2.875 x .203	3.500 x .216	10.750 x .365	3.500 x .300	10.750 x .365	3.500 x .300	12.750 x .375	3.500 x .300	3.500 x .300
	60		3.500 x .216	2.875 x .203	2.875 x .203	3.500 x .216	10.750 x .365	3.500 x .300	12.750 x .375	3.500 x .300	12.750 x .375	3.500 x .300	3.500 x .300
	70		3.500 x .216	2.875 x .203	2.875 x .203	3.500 x .216	10.750 x .365	3.500 x .300	12.750 x .375	3.500 x .300	14.000 x .375	5.563 x .258	3.500 x .300
	80		3.500 x .216	2.875 x .203	2.875 x .203	3.500 x .216	10.750 x .365	3.500 x .300	12.750 x .375	3.500 x .300	14.000 x .375	5.563 x .258	3.500 x .300
55	40		3.500 x .216	2.875 x .203	2.875 x .203	3.500 x .216	10.750 x .365	3.500 x .300	10.750 x .365	3.500 x .300	12.750 x .375	3.500 x .300	3.500 x .300
	60		3.500 x .216	2.875 x .203	2.875 x .203	3.500 x .216	10.750 x .365	3.500 x .300	12.750 x .375	3.500 x .300	14.000 x .375	5.563 x .258	3.500 x .300
	70		3.500 x .216	2.875 x .203	2.875 x .203	3.500 x .216	10.750 x .365	3.500 x .300	12.750 x .375	3.500 x .300	14.000 x .375	5.563 x .258	3.500 x .300
	80		3.500 x .216	2.875 x .203	2.875 x .203	3.500 x .216	12.750 x .375	3.500 x .300	14.000 x .375	5.563 x .258	16.000 x .375	5.563 x .258	3.500 x .300
65	40		3.500 x .216	2.875 x .203	2.875 x .203	3.500 x .216	10.750 x .365	3.500 x .300	12.750 x .375	3.500 x .300	12.750 x .375	3.500 x .300	3.500 x .300
	60		3.500 x .216	2.875 x .203	2.875 x .203	3.500 x .216	10.750 x .365	3.500 x .300	12.750 x .375	3.500 x .300	16.000 x .375	5.563 x .258	3.500 x .300
	70		4.000 x .226	2.875 x .203	2.875 x .203	3.500 x .216	12.750 x .375	3.500 x .300	14.000 x .375	5.563 x .258	16.000 x .375	5.563 x .258	3.500 x .300
	80		4.000 x .226	2.875 x .203	2.875 x .203	3.500 x .216	12.750 x .375	3.500 x .300	14.000 x .375	5.563 x .258	16.000 x .375	5.563 x .258	3.500 x .300
75	40		4.000 x .226	2.875 x .203	2.875 x .203	3.500 x .216	10.750 x .365	3.500 x .300	12.750 x .375	3.500 x .300	14.000 x .375	5.563 x .258	3.500 x .300
	60		4.500 x .237	2.875 x .203	2.875 x .203	3.500 x .216	12.750 x .375	3.500 x .300	14.000 x .375	5.563 x .258	16.000 x .375	5.563 x .258	3.500 x .300
	70		4.500 x .237	2.875 x .203	2.875 x .203	3.500 x .216	12.750 x .375	3.500 x .300	14.000 x .375	5.563 x .258	16.000 x .375	5.563 x .258	3.500 x .300
	80		4.500 x .237	2.875 x .203	2.875 x .203	3.500 x .216	12.750 x .375	3.500 x .300	14.000 x .500	5.563 x .258	16.000 x .500	5.563 x .258	3.500 x .300

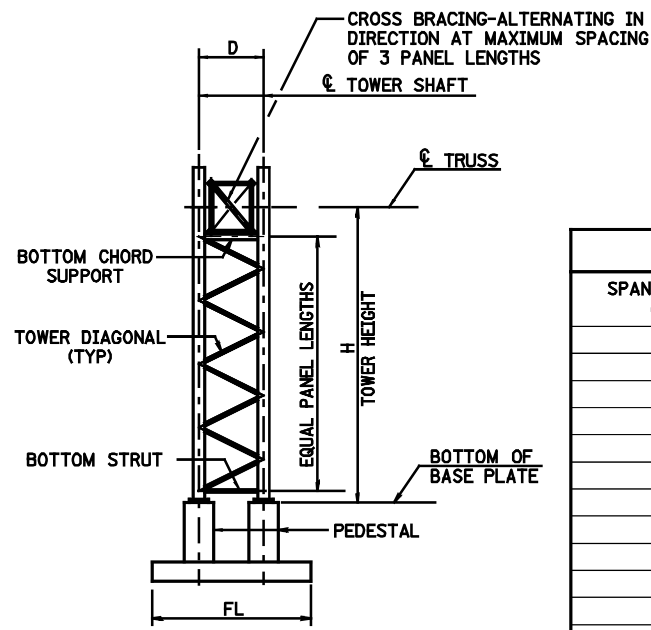
FOOTINGS H=25 FT: FLxFW (FT)	FOOTINGS H = 30 FT: FLxFW (FT)	FOOTINGS H = 40 FT: FLxFW (FT)	PEDESTALS H = 25 FT: PD (FT)	PEDESTALS H = 25 FT: VERT REBARS No. & SIZE	PEDESTALS H = 30 FT: PD (FT)	PEDESTALS H = 30 FT: VERT REBARS No. & SIZE	PEDESTALS H = 40 FT: PD (FT)	PEDESTALS H = 40 FT: VERT REBARS No. & SIZE	BARRIER PEDESTALS H = 25 FT: BLxBWT (FT)	BARRIER PEDESTALS H = 25 FT: VERT REBARS No. & SIZE	BARRIER PEDESTALS H = 30 FT: BLxBWT (FT)	BARRIER PEDESTALS H = 30 FT: VERT REBARS No. & SIZE	BARRIER PEDESTALS H = 40 FT: BLxBWT (FT)	BARRIER PEDESTALS H = 40 FT: VERT REBARS No. & SIZE	TRUSS SIZE	SIGN LENGTH (')	SPAN LENGTH (FT)
15 x 7	16 x 7	16 x 8	3.00	10-#19	3.00	11-#19	3.25	12-#19	9 x 2.50	31-#13	9 x 2.50	31-#13	9 x 2.50	31-#13	4' (WIDTH) x 4' (DEPTH)	40	45
15 x 7	16 x 8	18 x 8	3.00	9-#22	3.25	13-#19	3.25	14-#19	9 x 2.50	31-#13	9 x 2.50	23-#16	9 x 2.50	26-#16		60	
16 x 7	16 x 8	19 x 8	3.00	9-#22	3.25	13-#19	3.50	11-#22	9 x 2.50	23-#16	9 x 2.50	26-#16	10 x 2.75	28-#16		70	
16 x 8	18 x 8	19 x 8	3.00	10-#22	3.25	10-#22	3.50	11-#22	9 x 2.50	23-#16	9 x 2.50	26-#16	10 x 2.75	28-#16		80	
15 x 7	16 x 7	16 x 8	3.00	11-#19	3.00	12-#19	3.25	13-#19	9 x 2.50	31-#13	9 x 2.50	31-#13	9 x 2.50	24-#16		40	55
16 x 7	18 x 8	19 x 8	3.00	9-#22	3.25	10-#22	3.50	11-#22	9 x 2.50	23-#16	9 x 2.50	26-#16	10 x 2.75	28-#16		60	
16 x 8	18 x 8	19 x 9	3.00	10-#22	3.25	11-#22	3.50	12-#22	9 x 2.50	26-#16	9 x 2.50	29-#16	10 x 2.75	30-#16		70	
18 x 8	19 x 9	20 x 9	3.25	10-#22	3.50	11-#22	3.75	12-#22	9 x 2.50	26-#16	10 x 2.75	29-#16	10 x 3.00	32-#16		80	
16 x 7	16 x 8	19 x 8	3.00	9-#22	3.25	9-#22	3.25	10-#22	9 x 2.50	31-#13	9 x 2.50	35-#13	9 x 2.50	26-#16		40	65
16 x 8	18 x 9	20 x 9	3.00	10-#22	3.25	11-#22	3.75	12-#22	9 x 2.50	26-#16	9 x 2.50	29-#16	10 x 3.00	30-#16		60	
18 x 8	19 x 9	20 x 10	3.25	10-#22	3.50	11-#22	3.75	12-#22	9 x 2.50	26-#16	10 x 2.75	30-#16	10 x 3.00	32-#16		70	
18 x 9	20 x 9	21 x 10	3.25	11-#22	3.50	12-#22	3.75	13-#22	9 x 2.50	29-#16	10 x 2.75	30-#16	10 x 3.00	26-#19		80	
16 x 7	16 x 8	19 x 8	3.00	9-#22	3.25	10-#22	3.50	11-#22	9 x 2.50	23-#16	9 x 2.50	23-#16	10 x 2.75	28-#16		40	75
18 x 8	19 x 8	21 x 9	3.25	10-#22	3.50	11-#22	3.75	12-#22	9 x 2.50	26-#16	10 x 2.75	30-#16	10 x 3.00	32-#16		60	
19 x 8	20 x 9	21 x 10	3.25	11-#22	3.50	12-#22	3.75	13-#22	9 x 2.50	29-#16	10 x 2.75	32-#16	10 x 3.00	26-#19		70	
19 x 9	20 x 10	22 x 10	3.25	12-#22	3.50	10-#25	3.75	11-#25	9 x 2.50	31-#16	10 x 2.75	32-#16	10 x 3.00	28-#19		80	



PLAN



ELEVATION



END VIEW

NOTES:

1. THE NUMBER OF SPLICES AND PANELS SHOWN IN THE TABLE ARE OPTIONAL. ONE OR MORE SPLICES IN THE TRUSS MAY BE ADDED OR ELIMINATED AT THE OPTION OF THE FABRICATOR. THE FABRICATOR MUST MAINTAIN A TRUSS UNIT LENGTH WHICH CAN BE GALVANIZED IN ONE PIECE. A MINIMUM OF ONE SPLICE IS REQUIRED FOR OBTAINING CAMBER.

2. END STRUTS ARE DEFINED AS THE TWO HORIZONTAL AND TWO VERTICAL STRUTS LOCATED IMMEDIATELY ADJACENT TO THE TOWERS (SEE DRG. OH-D5).

SUGGESTED STEEL TRUSS UNITS

ACTUAL SPAN FROM (FT)	ACTUAL SPAN TO (FT)	DESIGN SPAN (FT)	No. OF SPLICES No.	No. OF SEGMENTS END	No. OF SEGMENTS MIDDLE	No. OF PANELS N No.	No. OF PANELS TOTAL No.
--	45	45	1	2	0	6	12
45	55	55	1	2	0	7	14
55	65	65	2	2	1	5	15
65	75	75	2	2	1	6	18
75	85	85	2	2	1	7	21
85	95	95	3	2	2	6	24
95	105	105	3	2	2	6	24
105	115	115	3	2	2	7	28
115	125	125	4	4	1	6	30
125	135	135	4	4	1	6	30
135	145	145	4	4	1	7	35
145	155	155	5	4	2	6	36
155	165	165	5	4	2	6	36

C A M B E R

SPAN LENGTH (FT)	REQUIRED CAMBER (IN)
45	1 1/4
55	1 3/8
65	2
75	2 5/8
85	2 5/8
95	3
105	3 3/4
115	4 1/4
125	4 7/8
135	5 5/8
145	6 3/4
155	7 3/4
165	8 7/8

THIS PLATE FOR DESIGN INFORMATION ONLY.
DO NOT INCLUDE IN CONTRACT PLANS.

SIGN STRUCTURE DRG. OH-G3

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

OVERHEAD SIGN SUPPORT STANDARDS DESIGN TABLES

STEEL TRUSSES AND STEEL TOWERS (SPAN LENGTH 45'-0" TO 75'-0")

SCALE : NONE

SPAN LENGTH (FT)	SIGN LENGTH (X)	TRUSS SIZE	TRUSS MEMBERS				TOWER MEMBERS							FOOTINGS			PEDESTALS						BARRIER PEDESTALS						TRUSS SIZE	SIGN LENGTH (X)	SPAN LENGTH (FT)
			CHORDS O.D.xTHICK (IN)	DIAGONALS O.D.xTHICK (IN)	STRUTS O.D.xTHICK (IN)	END STRUTS O.D.xTHICK (IN)	H = 25 FT SHAFT O.D.xTHICK (IN)	H = 25 FT DIAGONAL O.D.xTHICK (IN)	H = 30 FT SHAFT O.D.xTHICK (IN)	H = 30 FT DIAGONAL O.D.xTHICK (IN)	H = 40 FT SHAFT O.D.xTHICK (IN)	H = 40 FT DIAGONAL O.D.xTHICK (IN)	STRUTS O.D.xTHICK (IN)	H = 25 FT FLxFW (FT)	H = 30 FT FLxFW (FT)	H = 40 FT FLxFW (FT)	H = 25 FT PD (FT)	H = 25 FT VERT REBARS No. & SIZE	H = 30 FT PD (FT)	H = 30 FT VERT REBARS No. & SIZE	H = 40 FT PD (FT)	H = 40 FT VERT REBARS No. & SIZE	H = 25 FT BLxBWT (FT)	H = 25 FT VERT REBARS No. & SIZE	H = 30 FT BLxBWT (FT)	H = 30 FT VERT REBARS No. & SIZE	H = 40 FT BLxBWT (FT)	H = 40 FT VERT REBARS No. & SIZE			
85	40	4' (WIDTH) x 5' (DEPTH)	4.500x.237	2.875x.203	2.875x.203	3.500x.216	10.750x.365	3.500x.300	12.750x.375	3.500x.300	14.000x.375	5.563x.258	3.500x.300	16 x 8	18 x 8	20 x 9	3.00	10-#22	3.25	10-#22	3.50	11-#22	9 x 2.50	23-#16	9 x 2.50	26-#16	10 x 2.75	30-#16	4' (WIDTH) x 5' (DEPTH)	40	85
	60		5.563x.258	2.875x.203	2.875x.203	3.500x.216	12.750x.375	3.500x.300	14.000x.375	5.563x.258	16.000x.375	5.563x.258	3.500x.300	19 x 8	20 x 9	21 x 9	3.25	11-#22	3.50	12-#22	3.75	10-#25	9 x 2.50	29-#16	10 x 2.75	30-#16	10 x 3.00	23-#19		60	
	70		5.563x.258	2.875x.203	2.875x.203	3.500x.216	12.750x.375	3.500x.300	16.000x.375	5.563x.258	16.000x.500	5.563x.258	3.500x.300	20 x 9	20 x 10	22 x 10	3.25	12-#22	3.75	10-#25	3.75	11-#25	9 x 2.50	31-#16	10 x 3.00	32-#16	10 x 3.00	26-#19		70	
	80		5.563x.258	2.875x.203	2.875x.203	3.500x.216	14.000x.375	5.563x.258	16.000x.375	5.563x.258	16.000x.500	5.563x.258	3.500x.300	21 x 9	21 x 10	23 x 10	3.50	12-#22	3.75	11-#25	3.75	12-#25	10 x 2.75	32-#16	10 x 3.00	35-#16	10 x 3.00	28-#19		80	
95	40		5.563x.258	2.875x.203	2.875x.203	3.500x.216	12.750x.375	3.500x.300	12.750x.375	3.500x.300	16.000x.375	5.563x.258	3.500x.300	18 x 8	19 x 9	21 x 9	3.25	10-#22	3.25	11-#22	3.75	12-#25	9 x 2.50	26-#16	9 x 2.50	29-#16	10 x 3.00	23-#19		40	95
	60		5.563x.258	2.875x.203	2.875x.203	3.500x.216	12.750x.375	3.500x.300	16.000x.375	5.563x.258	16.000x.500	5.563x.258	3.500x.300	19 x 9	20 x 10	22 x 10	3.25	11-#22	3.75	10-#25	3.75	11-#25	9 x 2.50	31-#16	10 x 3.00	32-#16	10 x 3.00	26-#19		60	
	70		6.625x.280	2.875x.203	2.875x.203	3.500x.216	14.000x.375	5.563x.258	16.000x.375	5.563x.258	16.000x.500	5.563x.258	3.500x.300	20 x 9	21 x 10	23 x 10	3.50	12-#22	3.75	10-#25	3.75	12-#25	10 x 2.75	32-#16	10 x 3.00	26-#19	10 x 3.00	28-#19		70	
	80		6.625x.280	2.875x.203	2.875x.203	3.500x.216	14.000x.500	5.563x.258	16.000x.500	5.563x.258	18.000x.500	6.625x.280	3.500x.300	21 x 10	22 x 10	24 x 11	3.50	10-#25	3.75	11-#25	4.00	12-#25	10 x 2.75	25-#19	10 x 3.00	28-#19	11 x 3.25	29-#19		80	
105	40		5.563x.258	2.875x.203	2.875x.203	3.500x.216	12.750x.375	3.500x.300	14.000x.375	5.563x.258	16.000x.375	5.563x.258	3.500x.300	18 x 9	19 x 9	21 x 9	3.25	10-#22	3.50	11-#22	3.75	12-#22	9 x 2.50	26-#16	10 x 2.75	30-#16	10 x 3.00	23-#19		40	105
	60		6.625x.280	2.875x.203	2.875x.203	3.500x.216	14.000x.375	5.563x.258	16.000x.375	5.563x.258	16.000x.500	5.563x.258	5.563x.258	20 x 9	21 x 10	23 x 10	3.50	12-#22	3.75	10-#25	3.75	12-#25	10 x 2.75	21-#19	10 x 3.00	25-#19	10 x 3.00	28-#19		60	
	70		6.625x.280	2.875x.203	2.875x.203	3.500x.216	14.000x.500	5.563x.258	16.000x.500	5.563x.258	18.000x.500	6.625x.280	5.563x.258	21 x 10	21 x 11	23 x 11	3.50	10-#25	3.75	11-#25	4.00	12-#25	10 x 2.75	25-#19	10 x 3.00	28-#19	11 x 3.25	29-#19		70	
	80		8.625x.322	2.875x.203	2.875x.203	3.500x.216	14.000x.500	5.563x.258	16.000x.500	5.563x.258	18.000x.500	6.625x.280	5.563x.258	22 x 10	22 x 11	24 x 11	3.50	10-#25	3.75	12-#25	4.00	13-#25	10 x 2.75	26-#19	10 x 3.00	31-#19	11 x 3.25	33-#19		80	
115	40		6.625x.280	2.875x.203	2.875x.203	3.500x.216	14.000x.375	5.563x.258	14.000x.375	5.563x.258	16.000x.375	5.563x.258	5.563x.258	19 x 9	20 x 9	21 x 10	3.50	10-#22	3.50	12-#22	3.75	10-#25	10 x 2.75	30-#16	10 x 2.75	30-#16	10 x 3.00	23-#19		40	115
	60		8.625x.322	2.875x.203	2.875x.203	3.500x.216	14.000x.375	5.563x.258	16.000x.375	5.563x.258	18.000x.375	6.625x.280	5.563x.258	20 x 10	21 x 10	23 x 11	3.50	12-#22	3.75	10-#25	4.00	12-#25	10 x 2.75	23-#19	10 x 3.00	26-#19	11 x 3.25	28-#19		60	
	70		8.625x.322	2.875x.203	2.875x.203	3.500x.216	14.000x.500	5.563x.258	16.000x.500	5.563x.258	18.000x.500	6.625x.280	5.563x.258	21 x 10	22 x 11	24 x 11	3.50	10-#25	3.75	11-#25	4.00	13-#25	10 x 2.75	26-#19	10 x 3.00	28-#19	11 x 3.25	33-#19		70	
	80		8.625x.322	2.875x.203	2.875x.203	3.500x.216	14.000x.500	5.563x.258	16.000x.500	5.563x.258	18.000x.500	6.625x.280	5.563x.258	22 x 10	23 x 11	25 x 11	3.50	11-#25	3.75	13-#25	4.00	15-#25	10 x 2.75	28-#19	10 x 3.00	31-#19	11 x 3.25	25-#22		80	
125	40		8.625x.322	2.875x.203	2.875x.203	3.500x.216	14.000x.375	5.563x.258	16.000x.375	5.563x.258	16.000x.500	5.563x.258	5.563x.258	20 x 9	20 x 10	22 x 10	3.50	11-#22	3.75	12-#22	3.75	10-#25	10 x 2.75	30-#16	10 x 3.00	23-#19	10 x 3.00	26-#19		40	125
	60		8.625x.322	2.875x.203	2.875x.203	3.500x.216	14.000x.500	5.563x.258	16.000x.500	5.563x.258	18.000x.500	6.625x.280	5.563x.258	21 x 10	23 x 10	24 x 11	3.50	10-#25	3.75	11-#25	4.00	12-#25	10 x 2.75	25-#19	10 x 3.00	28-#19	11 x 3.25	29-#19		60	
	70		8.625x.322	2.875x.203	2.875x.203	3.500x.216	14.000x.500	5.563x.258	16.000x.500	5.563x.258	18.000x.500	6.625x.280	5.563x.258	22 x 10	23 x 11	25 x 11	3.50	11-#25	3.75	12-#25	4.00	14-#25	10 x 2.75	28-#19	10 x 3.00	31-#19	11 x 3.25	33-#19		70	
	80		8.625x.322	2.875x.203	2.875x.203	3.500x.216	16.000x.500	5.563x.258	18.000x.500	6.625x.280	20.000x.500	6.625x.280	5.563x.258	23 x 10	24 x 11	25 x 12	3.75	11-#25	4.00	13-#25	4.25	15-#25	10 x 3.00	28-#19	11 x 3.25	32-#19	11 x 4.00	25-#22		80	
135	40		8.625x.322	2.875x.203	2.875x.203	3.500x.216	14.000x.375	5.563x.258	16.000x.375	5.563x.258	16.000x.500	5.563x.258	5.563x.258	20 x 10	21 x 10	22 x 11	3.50	11-#22	3.75	10-#25	3.75	11-#25	10 x 2.75	30-#16	10 x 3.00	23-#19	10 x 3.00	27-#19		40	135
	60		10.750x.365	2.875x.203	2.875x.203	3.500x.216	14.000x.500	5.563x.258	16.000x.500	5.563x.258	18.000x.500	6.625x.280	5.563x.258	22 x 10	23 x 11	25 x 11	3.50	10-#25	3.75	12-#25	4.00	13-#25	10 x 2.75	27-#19	10 x 3.00	31-#19	11 x 3.25	33-#19		60	
	70		10.750x.365	2.875x.203	2.875x.203	3.500x.216	14.000x.500	5.563x.258	18.000x.500	6.625x.280	20.000x.500	6.625x.280	5.563x.258	22 x 11	24 x 11	25 x 12	3.50	11-#25	4.00	12-#25	4.25	14-#25	10 x 2.75	28-#19	11 x 3.25	31-#19	11 x 4.00	25-#22		70	
	80		10.750x.365	2.875x.203	2.875x.203	3.500x.216	16.000x.500	5.563x.258	18.000x.500	6.625x.280	20.000x.500	6.625x.280	5.563x.258	23 x 11	25 x 11	26 x 12	3.75	12-#25	4.00	14-#25	4.25	15-#25	10 x 3.00	31-#19	11 x 3.25	32-#19	11 x 4.00	27-#22		80	
145	40		10.750x.365	3.500x.216	3.500x.216	3.500x.216	14.000x.375	5.563x.258	16.000x.375	5.563x.258	16.000x.500	5.563x.258	5.563x.258	20 x 10	22 x 10	23 x 11	3.50	11-#22	3.75	10-#25	3.75	11-#25	10 x 2.75	21-#19	10 x 3.00	25-#19	10 x 3.00	28-#19		40	145
	60		10.750x.365	3.500x.216	3.500x.216	3.500x.216	14.000x.500	5.563x.258	16.000x.500	5.563x.258	18.000x.500	6.625x.280	5.563x.258	23 x 10	24 x 11	25 x 12	3.50	11-#25	3.75	13-#25	4.00	14-#25	10 x 2.75	28-#19	10 x 3.00	31-#19	11 x 3.25	25-#22		60	
	70		10.750x.365	3.500x.216	3.500x.216	3.500x.216	16.000x.500	5.563x.258	18.000x.500	6.625x.280	20.000x.500	6.625x.280	5.563x.258	23 x 11	24 x 12	26 x 12	3.75	11-#25	4.00	13-#25	4.25	15-#25	10 x 3.00	28-#19	11 x 3.25	32-#19	11 x 4.00	27-#22		70	
	80		10.750x.365	3.500x.216	3.500x.216	3.500x.216	16.000x.500	5.563x.258	18.000x.500	6.625x.280	20.000x.500	6.625x.280	5.563x.258	24 x 11	24 x 12	27 x 12	3.75	12-#25	4.00	14-#25	4.25	13-#29	10 x 3.00	31-#19	11 x 3.25	35-#19	11 x 4.00	29-#22		80	
155	40		10.750x.365	3.500x.216	3.500x.216	3.500x.216	14.000x.375	5.563x.258	16.000x.500	5.563x.258	18.000x.500	6.625x.280	5.563x.258	21 x 10	22 x 10	23 x 11	3.50	12-#22	3.75	10-#25	4.00	11-#25	10 x 2.75	23-#19	10 x 3.00	27-#19	11 x 3.25	28-#19		40	155
	60		12.750x.375	3.500x.216	3.500x.216	3.500x.216	16.000x.500	5.563x.258	18.000x.500	6.625x.280	20.000x.500	6.625x.280	5.563x.258	23 x 10	24 x 11	26 x 12	3.75	11-#25	4.00	12-#25	4.25	14-#25	10 x 3.00	28-#19	11 x 3.25	32-#19	11 x 4.00	25-#22		60	
	70		12.750x.375	3.500x.216	3.500x.216	3.500x.216	16.000x.500	5.563x.258	18.000x.500	6.625x.280	20.000x.500	6.625x.280	5.563x.258	23 x 11	24 x 12	27 x 12	3.75	12-#25	4.00	14-#25	4.25	15-#25	10 x 3.00	23-#22	11 x 3.25	35-#19	11 x 4.00	27-#22		70	
	80		12.750x.375	3.500x.216	3.500x.216	3.500x.216	16.000x.500	5.563x.258	20.000x.500	6.625x.280	22.000x.500	6.625x.280	5.563x.258	24 x 11	25 x 12	27 x 13	3.75	13-#25	4.25	14-#25	4.75	13-#29	10 x 3.00	25-#22	11 x 4.00	27-#22	11.5 x 4.00	30-#22		80	
165	40		12.750x.375	3.500x.216	3.500x.216	3.500x.216	14.000x.500	5.563x.258	16.000x.500	5.563x.258	18.000x.500	6.625x.280	5.563x.258	21 x 10	23 x 10	24 x 11	3.50	12-#25	3.75	10-#25	4.00	12-#25	10 x 2.75	25-#19	10 x 3.00	28-#19	11 x 3.25	29-#19		40	165
	60		12.750x.375	3.500x.216	3.500x.216	3.500x.216	16.000x.500	5.563x.258	18.000x.500	6.625x.280	20.000x.500	6.625x.280	5.563x.258	23 x 11	24 x 12	27 x 12	3.75	11-#25	4.00	13-#25	4.25	15-#25	10 x 3.00	28-#19	11 x 3.25	32-#19	11 x 4.00	27-#22		60	
	70		14.000x.375	3.500x.216	3.500x.216	3.500x.216	16.000x.500	5.563x.258	18.000x.500	6.625x.280	22.000x.500	6.625x.280	5.563x.258	24 x 11	24 x 13	27 x 13	3.75	13-#25	4.00	15-#25	4.75	15-#25	10 x 3.00	25-#22	11 x 3.25	35-#19	11.5 x 4.00	30-#22		70	
	80		14.000x.375	3.500x.216	3.500x.216	3.500x.216	18.000x.500	6.625x.280	20.000x.500	6.625x.280	22.000x.500	6.625x.280	5.563x.258	24 x 12	24 x 13	27 x 13	4.00	13-#25	4.25	12-#25	4.75	14-#29	11 x 3.25	25-#22	11 x 4.00	27-#22	11.5 x 4.00	32-#22		80	

NOTE:

END STRUTS ARE DEFINED AS THE TWO HORIZONTAL AND TWO VERTICAL STRUTS LOCATED IMMEDIATELY ADJACENT TO THE TOWERS (SEE DRG. OH-D5).

THIS PLATE FOR DESIGN INFORMATION ONLY.
DO NOT INCLUDE IN CONTRACT PLANS.

SIGN STRUCTURE DRG. OH-G4

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

OVERHEAD SIGN SUPPORT STANDARDS DESIGN TABLES

STEEL TRUSSES AND STEEL TOWERS (SPAN LENGTH 85'-0" TO 165'-0")

SCALE : NONE

BOARD 03 - ORIGINAL SHEET

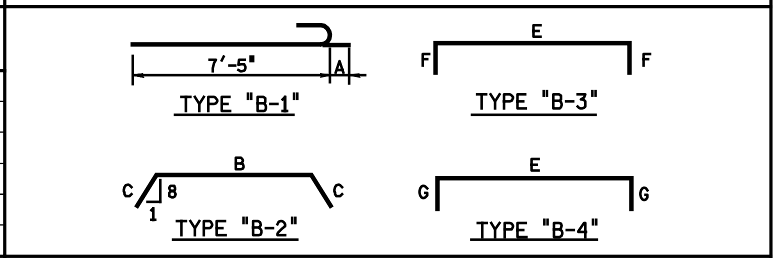
BARRIER PEDESTAL REINFORCEMENT

BARRIER SIZE BLxBWT (FT)	VOL OF CONC (C.Y.)	HORIZONTAL BARS #13 BAR, TYPE "B-2" No.	B	C	LENGTH	#13 BAR, TYPE "B-3" No.	E	F	LENGTH	#13 BAR, TYPE "B-4" No.	E	G	LENGTH	WEIGHT TOTAL (LBS)
9 x 2.50	7.1	10	2'-0"	1'-0"	4'-0"	8	5'-8"	2'-2"	10'-0"	8	5'-8"	2'-8"	11'-0"	139
10 x 2.75	8.5	11	2'-3"	1'-0"	4'-3"	8	6'-4"	2'-4"	11'-0"	8	6'-4"	2'-9"	11'-10"	153
10 x 3.00	9.0	11	2'-6"	1'-0"	4'-6"	8	6'-4"	2'-5"	11'-2"	8	6'-4"	2'-10"	12'-0"	158
11 x 3.25	10.6	12	2'-9"	1'-0"	4'-9"	8	7'-0"	2'-7"	12'-2"	8	7'-0"	2'-11"	12'-10"	172
11 x 4.00	12.4	12	3'-6"	1'-0"	5'-6"	8	7'-0"	2'-11"	12'-10"	8	7'-0"	3'-4"	13'-8"	185
11.5 x 4.00	13.0	13	3'-6"	1'-0"	5'-6"	8	7'-4"	2'-11"	13'-2"	8	7'-4"	3'-4"	14'-0"	192

VERTICAL "B-1" BARS

SIZE	A (IN)	LENGTH	WEIGHT (LBS)
#13	6	7'-11"	5.290
#16	7	8'-0"	8.377
#19	8	8'-1"	12.125
#22	10	8'-3"	16.976

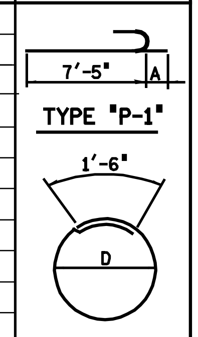
BAR SHAPES

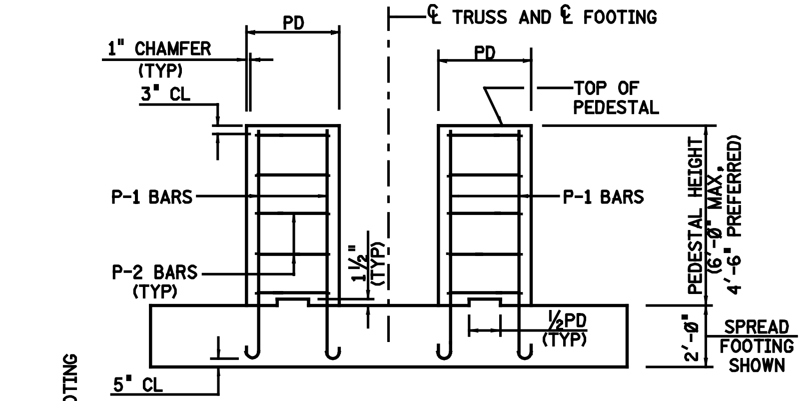


PEDESTAL REINFORCEMENT

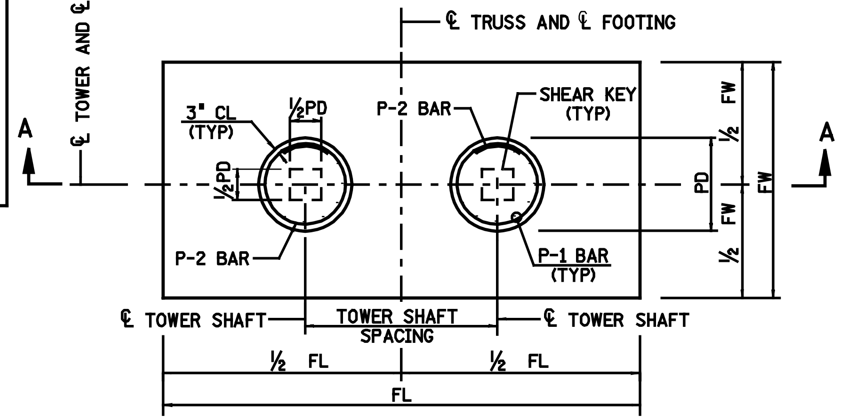
PEDESTAL DIAMETER PD (FT)	VOL OF CONC (C.Y.)	VERTICAL BARS TYPE "P-1" SIZE	A	LENGTH	WEIGHT (LBS)	HORIZ BARS 7-#13 BARS, TYPE "P-2" D	LENGTH	WEIGHT (LBS)
3.00	1.6	#19	0'-8"	8'-1"	11.9	2'-8"	10'-0"	46.7
3.00	1.6	#22	0'-10"	8'-3"	16.8	2'-8"	10'-0"	46.7
3.25	1.8	#19	0'-8"	8'-1"	11.9	3'-0"	11'-0"	51.6
3.25	1.8	#22	0'-10"	8'-3"	16.8	3'-0"	11'-0"	51.6
3.50	2.1	#22	0'-10"	8'-3"	16.8	3'-2"	11'-6"	53.8
3.50	2.1	#25	0'-11"	8'-4"	22.3	3'-2"	11'-6"	53.8
3.75	2.5	#22	0'-10"	8'-3"	16.8	3'-4"	12'-0"	56.2
3.75	2.5	#25	0'-11"	8'-4"	22.3	3'-4"	12'-0"	56.2
4.00	2.8	#25	0'-11"	8'-4"	22.3	3'-8"	13'-0"	61.1
4.25	3.2	#25	0'-11"	8'-4"	22.3	4'-0"	14'-1"	65.9
4.25	3.2	#29	1'-3"	8'-8"	29.3	4'-0"	14'-1"	65.9
4.75	3.9	#25	0'-11"	8'-4"	22.3	4'-4"	15'-1"	70.8
4.75	3.9	#29	1'-3"	8'-8"	29.3	4'-4"	15'-1"	70.8

BAR SHAPES





SECTION A-A

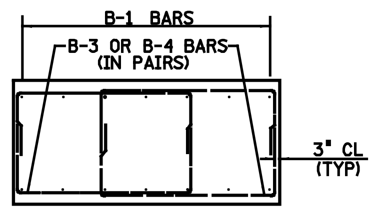


PLAN

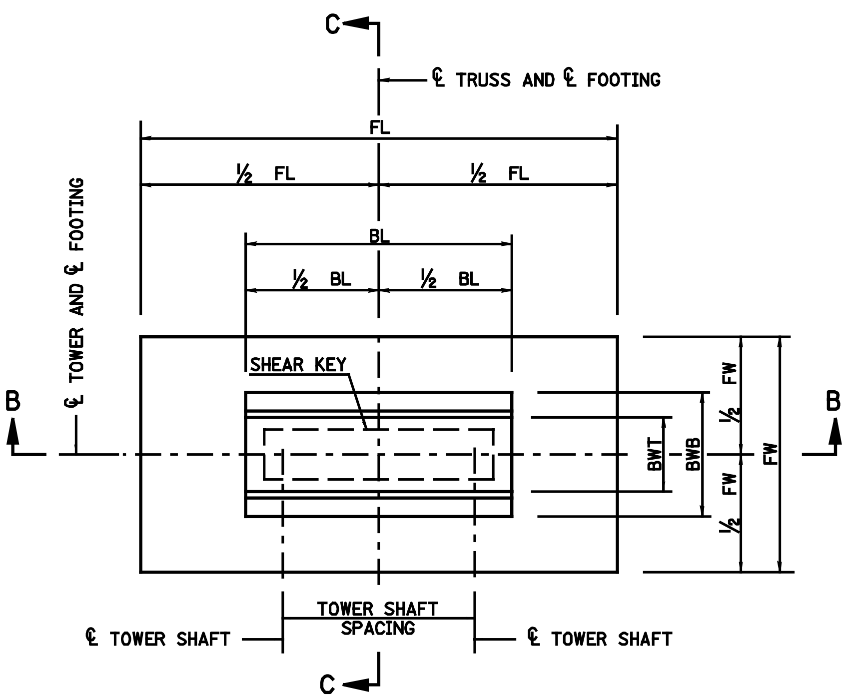
PEDESTAL DETAILS

NOTES:

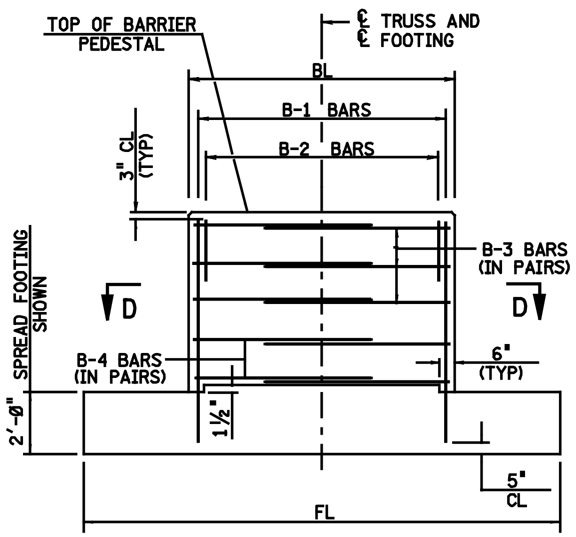
1. FOR GENERAL NOTES SEE SIGN STRUCTURE DRG. OH-G1.
2. FOR PEDESTAL AND BARRIER PEDESTAL DIMENSIONS AND REINFORCEMENT, SEE DESIGN TABLES ON SIGN STRUCTURE DRGS. OH-G3 AND OH-G4.
3. ALL REINFORCEMENT IN PEDESTALS AND BARRIER PEDESTALS SHALL BE CORROSION PROTECTED.
4. EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 1"x 1" UNLESS NOTED OTHERWISE.
5. BARS SHALL NOT BE SPLICED EXCEPT AS PROVIDED ON THIS DRAWING OR AUTHORIZED BY THE ENGINEER. WHEN SPLICING IS APPROVED, THE REINFORCEMENT BARS SHALL BE LAPPED FOR A LENGTH OF AT LEAST 36 DIAMETERS AND SHALL BE SECURELY WIRED TOGETHER.
6. LENGTH OF BARS SHOWN IN TABLE ALREADY CONSIDER BENDS. DIMENSIONS DESCRIBED IN BAR SHAPES TABLE ARE OUT-TO-OUT OF BAR.
7. CONCRETE VOLUMES AND REINFORCEMENT SHOWN IN TABLES ARE FOR A 6'-0" HIGH PEDESTAL OR 6'-0" HIGH BARRIER PEDESTAL.
8. WEIGHT SHOWN IN TABLE FOR B-1 AND P-1 BARS IS FOR ONE BAR ONLY. TOTAL WEIGHT OF BARS TO BE DETERMINED BY THE DESIGNER.



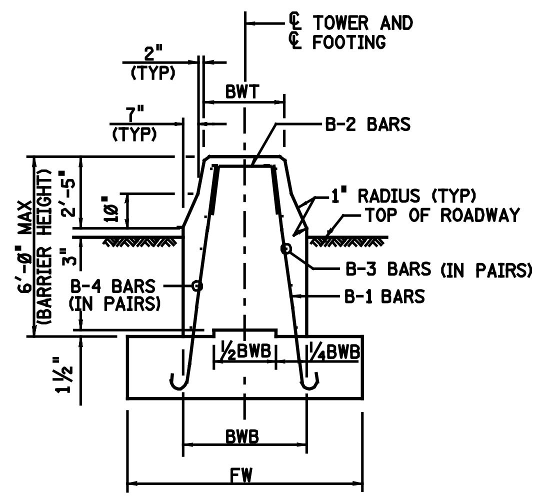
SECTION D-D



PLAN



SECTION B-B



SECTION C-C

BARRIER PEDESTAL DETAILS

THIS PLATE FOR DESIGN INFORMATION ONLY. DO NOT INCLUDE IN CONTRACT PLANS.

SIGN STRUCTURE DRG. OH-G5

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

OVERHEAD SIGN SUPPORT STANDARDS

PEDESTAL AND BARRIER PEDESTAL DESIGN TABLES AND DETAILS

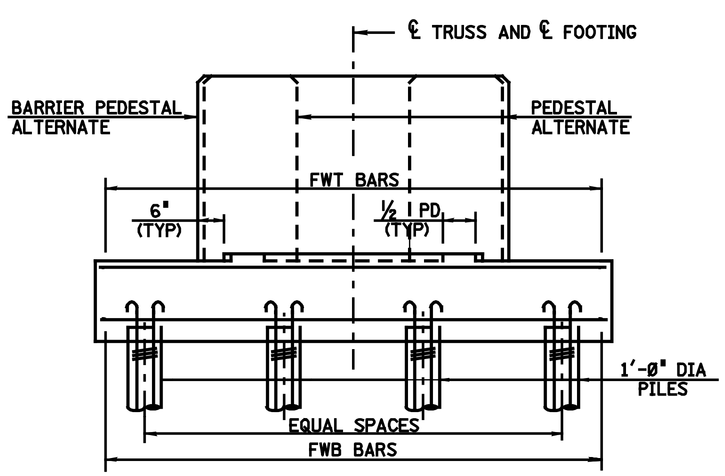
SCALE : NONE

SPREAD FOOTINGS			PILE FOOTINGS					FOOTING REINFORCEMENT				
SIZE FLxFW	CONCRETE VOLUME	EXCAV * VOLUME	CONCRETE VOLUME	EXCAV ** VOLUME	No.OF PILES IN ROW		TOTAL	No. AND SIZE OF BARS				TOTAL WEIGHT
(FT)	(C.Y.)	(C.Y.)	(C.Y.)	(C.Y.)	"X" LONG	"Y" TRANS	No.	FLB	FWB	FLT	FWT	(LBS)
15 x 7	7.8	37.9	9.8	40.3	4	3	12	6-#16	11-#16	6-#16	11-#16	342.6
16 x 7	8.3	40.3	10.4	42.8	4	3	12	8-#16	11-#16	6-#16	11-#16	384.5
16 x 8	9.5	45.3	11.9	48.1	4	3	12	10-#16	12-#16	6-#16	12-#16	465.4
18 x 8	10.7	50.7	13.4	53.9	5	3	15	12-#16	13-#16	6-#16	13-#16	546.1
18 x 9	12.0	56.3	15.0	59.8	5	3	15	13-#16	13-#16	7-#16	13-#16	605.2
19 x 8	11.3	53.3	14.1	56.6	5	3	15	10-#19	13-#16	7-#16	14-#16	635.4
19 x 9	12.7	59.2	15.9	62.9	5	3	15	12-#19	13-#16	7-#16	14-#16	714.3
20 x 9	13.3	62.2	16.6	66.1	5	3	15	13-#19	14-#16	8-#16	14-#16	793.2
20 x 10	14.8	68.4	18.5	72.7	5	3	15	13-#19	14-#16	8-#16	14-#16	817.3
21 x 9	14.0	65.2	17.5	69.3	5	3	15	14-#19	15-#16	9-#16	15-#16	910.5
21 x 10	15.6	71.7	19.5	76.2	5	3	15	17-#19	15-#16	10-#16	15-#16	1,052.7
21 x 11	17.1	78.3	21.4	83.2	5	4	20	18-#19	16-#16	10-#16	15-#16	1,120.8
22 x 10	16.3	75.0	20.4	79.7	5	3	15	15-#22	16-#16	8-#19	15-#16	1,238.8
22 x 11	17.9	81.8	22.4	86.9	5	4	20	16-#22	18-#16	8-#19	15-#16	1,331.4
23 x 10	17.0	78.2	21.3	83.1	5	4	20	17-#22	16-#16	9-#19	16-#16	1,410.1
23 x 11	18.7	85.3	23.4	90.6	5	4	20	19-#22	20-#16	9-#19	16-#16	1,573.2
24 x 11	19.6	88.9	24.5	94.5	5	4	20	22-#22	20-#16	12-#19	17-#16	1,928.2
24 x 12	21.3	96.3	26.6	102.3	5	4	20	22-#22	23-#16	12-#19	17-#16	1,994.7
24 x 13	23.1	103.7	28.9	110.2	6	4	24	24-#22	28-#16	13-#19	17-#16	2,265.5
25 x 11	20.4	92.4	25.5	98.2	5	4	20	21-#22	19-#16	13-#19	18-#16	1,966.3
25 x 12	22.2	100.1	27.8	106.4	5	4	20	19-#25	23-#16	13-#19	18-#16	2,240.1
26 x 12	23.1	104.0	28.9	110.5	6	4	24	19-#25	22-#16	14-#19	18-#16	2,325.0
27 x 12	24.0	107.9	30.3	114.6	6	4	24	21-#25	23-#16	15-#19	19-#16	2,590.0
27 x 13	26.0	116.1	32.5	123.4	6	4	24	24-#25	31-#16	16-#19	19-#16	3,023.0

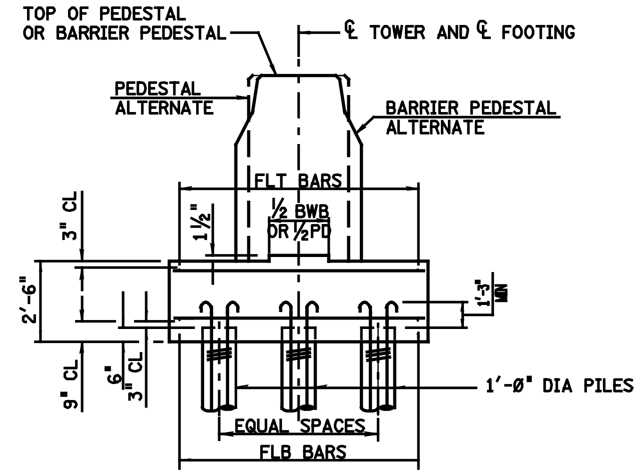
* SPREAD FOOTING EXCAVATION VOLUME BASED ON 8'-0" TOTAL DEPTH OF EXCAVATION.
** PILE FOOTING EXCAVATION VOLUME BASED ON 8'-6" TOTAL DEPTH OF EXCAVATION.

LEGEND:

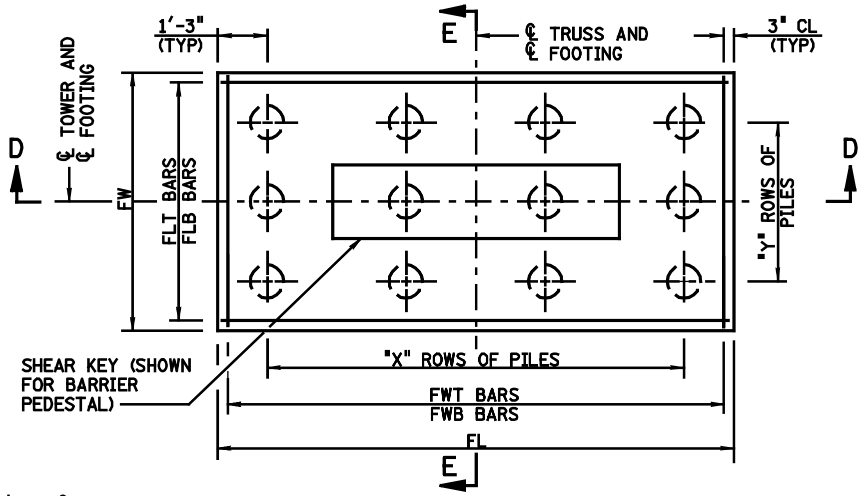
FL = FOOTING LENGTH
FW = FOOTING WIDTH
FLB = No. AND SIZE OF BOTTOM BARS IN DIRECTION FL
FWB = No. AND SIZE OF BOTTOM BARS IN DIRECTION FW
FLT = No. AND SIZE OF TOP BARS IN DIRECTION FL
FWT = No. AND SIZE OF TOP BARS IN DIRECTION FW
PD = PEDESTAL DIAMETER
BWT = BARRIER WIDTH AT TOP



SECTION D-D

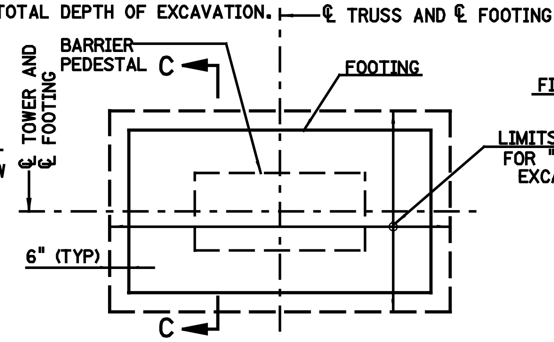


SECTION E-E

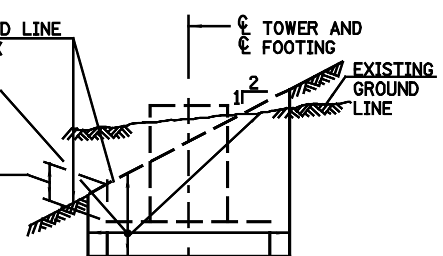


PLAN

PILE FOOTING DETAILS

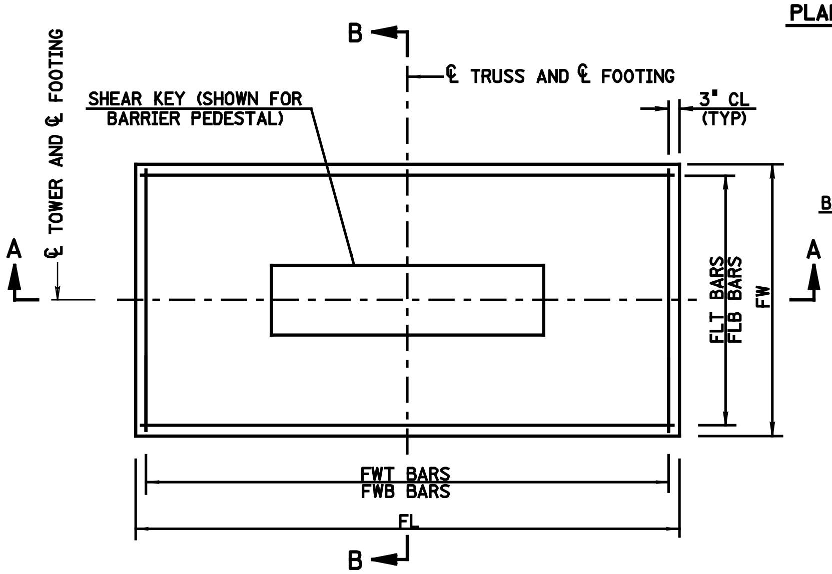


PLAN

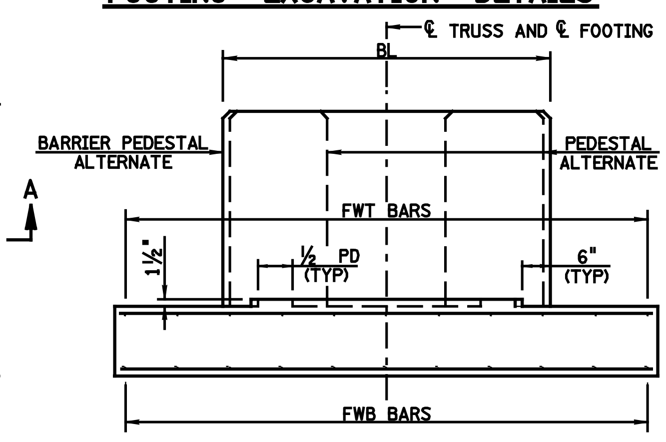


SECTION C-C

FOOTING EXCAVATION DETAILS

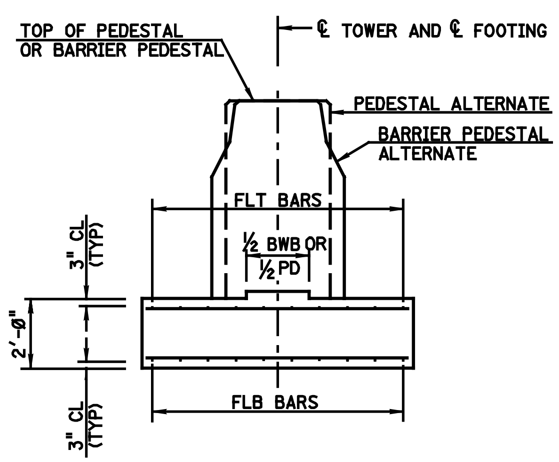


PLAN



SECTION A-A

SPREAD FOOTING DETAILS



SECTION B-B

NOTES:

1. FOR GENERAL NOTES, SEE SIGN STRUCTURE DRG. OH-G1.
2. FOR FOOTING DIMENSIONS, SEE DESIGN TABLES ON SIGN STRUCTURE DRGS. OH-G3 AND OH-G4.
3. BARS SHALL NOT BE SPLICED EXCEPT AS PROVIDED ON THIS DRAWINGS OR AUTHORIZED BY THE ENGINEER. WHEN SPLICING IS APPROVED, THE REINFORCEMENT BARS SHALL BE LAPPED FOR A LENGTH OF AT LEAST 36 DIAMETERS AND SHALL BE SECURELY WIRED TOGETHER.
4. PILES SHALL BE CAST-IN-PLACE CONCRETE PILES WITH A MINIMUM BEARING CAPACITY EQUAL TO 50 KIPS.
5. PILE DESIGN SHALL CONFORM TO AASHTO SPECIFICATIONS FOR THE SEISMIC DESIGN OF HIGHWAY BRIDGES, SEISMIC PERFORMANCE CATEGORY B, SUBSECTION 6.3.1(C).
6. THE CASING OF THE CAST-IN-PLACE CONCRETE PILES SHALL BE LEFT IN PLACE AND SHALL BE DESIGNED TO RESIST BOTH DIRECT COMPRESSION AND BENDING. THE THICKNESS OF THE CASING SHALL BE NOT LESS THAN 3/16".
7. THE LONGITUDINAL REINFORCING STEEL OF THE CAST-IN-PLACE CONCRETE PILES SHALL BE A MINIMUM OF 6-#16 BARS AND SHALL EXTEND THROUGH THE UPPER THIRD OF THE PILE OR 15'-0" DOWN INTO THE CASING, WHICHEVER IS GREATER, AND EMBEDDED INTO THE FOOTING WITH STANDARD HOOKS AS SHOWN.
8. THE SPIRAL REINFORCING FOR THE CAST-IN-PLACE CONCRETE PILES SHALL BE #13 REBARS AND SHALL EXTEND THROUGH THE UPPER THIRD OF THE PILE OR 15'-0" DOWN FROM THE TOP OF CASING, WHICHEVER IS GREATER.
9. ALTERNATE FOUNDATION DESIGNS MAY BE CONSIDERED BY THE DESIGNER WHERE APPROPRIATE. LOADS FOR THE DESIGN OF NON-STANDARD FOUNDATIONS ARE AVAILABLE FROM THE BUREAU OF STRUCTURAL ENGINEERING.

THIS PLATE FOR DESIGN INFORMATION ONLY. DO NOT INCLUDE IN CONTRACT PLANS.

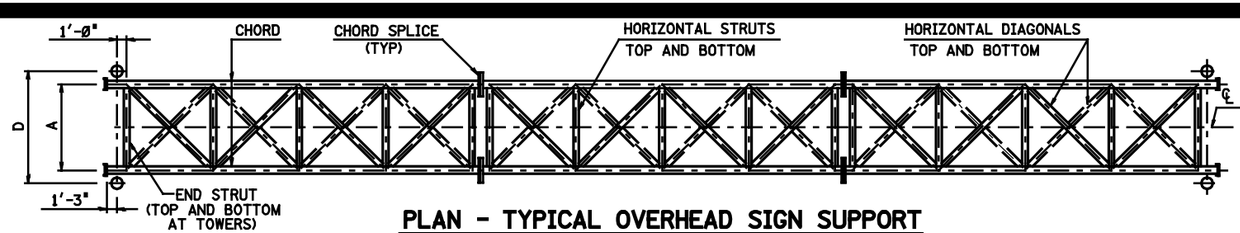
SIGN STRUCTURE DRG. OH-G6

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

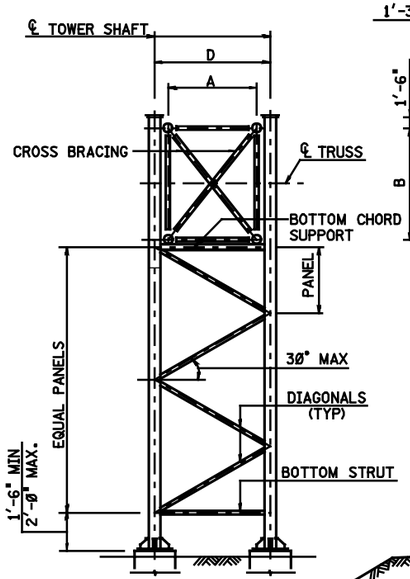
OVERHEAD SIGN SUPPORT STANDARDS

FOOTING DESIGN TABLES AND DETAILS

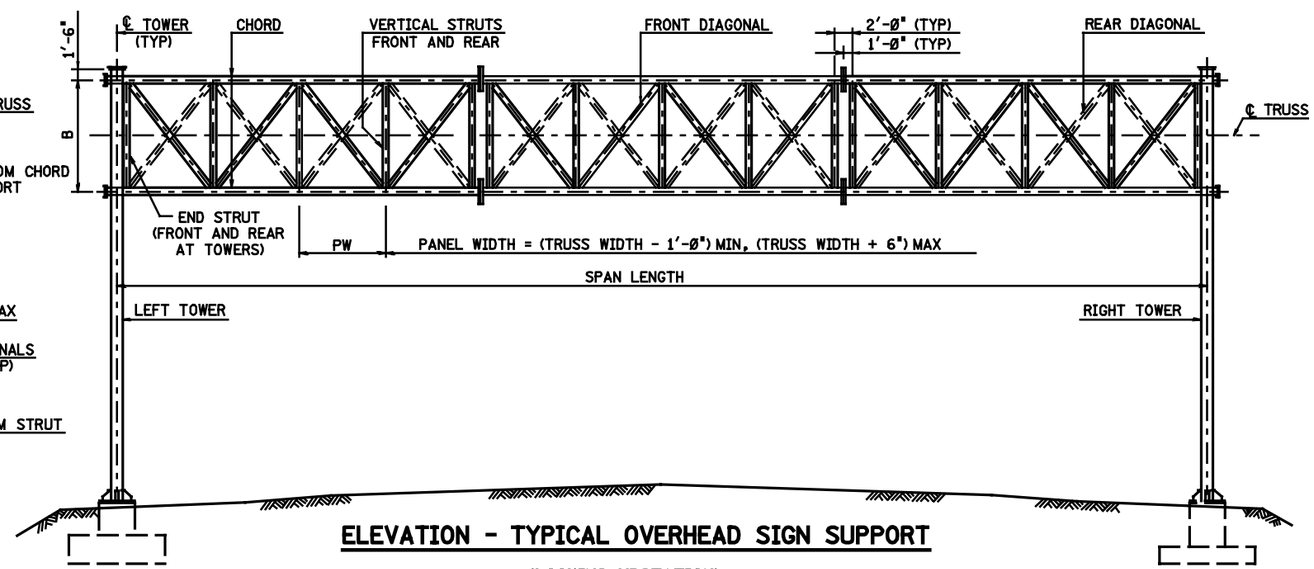
SCALE : NONE



PLAN - TYPICAL OVERHEAD SIGN SUPPORT



END ELEVATION



ELEVATION - TYPICAL OVERHEAD SIGN SUPPORT

(LOOKING UPSTATION)

INDEX OF DRAWINGS

DRG NO.	DESCRIPTION
OH-D1	GENERAL NOTES, PLAN AND ELEVATIONS
OH-D2	SCHEDULE OF STRUCTURES
OH-D3	SCHEDULE OF FOUNDATIONS AND MISCELANEOUS DETAILS
OH-D4	FOUNDATION DETAILS
OH-D5	STEEL TRUSS DETAILS - SHEET 1
OH-D6	STEEL TRUSS DETAILS - SHEET 2
OH-D7	STEEL TOWER DETAILS
OH-D8	TOWER SHAFT BASE AND TRUSS SEAT DETAILS
OH-D9	MAINTENANCE WALKWAY DETAILS
OH-D10	TYPICAL ELECTRICAL DETAILS

GENERAL NOTES

A. DESIGN CRITERIA

DESIGN SPECIFICATIONS

1996 AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES (16TH EDITION) AS MODIFIED BY SECTION 3 AND SECTION 32 OF THE CURRENT NJDOT DESIGN MANUAL - BRIDGES AND STRUCTURES, AND 1994 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS.

DESIGN LOADS

DESIGN WIND VELOCITY ---- 8Ø MPH
DESIGN ICE LOAD ---------- 3 PSF

SEISMIC LOADS FOR SEISMIC PERFORMANCE CATEGORY (SPC) B, A=Ø.18, SOIL PROFILE IV (REF. 1996 AASHTO, DIVISION 1A).

FATIGUE LOADS

ALL STRUCTURAL DETAILS HAVE BEEN DESIGNED FOR FATIGUE RESISTANCE UNDER THE FOLLOWING FATIGUE LOADS:

1) NATURAL WIND GUSTS: Pnw = 5.2Cd (PSF),
WHERE Cd IS THE DRAG COEFFICIENT SPECIFIED IN SECTION 1.2.5 OF THE 1994 STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS. NATURAL WIND GUST PRESSURE RANGE APPLIED IN THE HORIZONTAL DIRECTION TO THE AREA PROJECTED ON A VERTICAL PLANE OF ALL SUPPORT STRUCTURE MEMBERS, SIGN PANELS AND WALKWAYS.

2) TRUCK-INDUCED GUSTS: Ptg = 36.6Cd (PSF),
WHERE Cd IS THE DRAG COEFFICIENT SPECIFIED IN SECTION 1.2.5 OF THE 1994 STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS. TRUCK GUST PRESSURE RANGE APPLIED IN THE UPWARD VERTICAL DIRECTION ALONG THE FULL LENGTH OF THE TRUSS SPAN TO THE AREA PROJECTED ON A HORIZONTAL PLANE OF ALL SUPPORT STRUCTURE MEMBERS, SIGN PANELS, AND WALKWAYS.

VARIABLE MESSAGE SIGN (VMS) STRUCTURES

REFER TO SECTION 32 OF THE NJDOT DESIGN MANUAL - BRIDGES AND STRUCTURES WHEN FURNISHING SUPPORT STRUCTURES FOR VARIABLE MESSAGE SIGNS (VMS).

CONCRETE DESIGN STRESSES

SPECIFIED COMPRESSIVE STRENGTH (f'c) (CLASS B) ---- 3,ØØØ PSI
EXTREME FIBER COMPRESSIVE STRESS (fc) ---------- 1,2ØØ PSI

REINFORCEMENT STEEL DESIGN STRESS

TENSILE STRESS (fs) (A615, GRADE 6Ø) ---- 24 KSI

STRUCTURAL STEEL DESIGN STRENGTHS

YIELD STRENGTH (Fy)
PIPES (A53, TYPE S OR TYPE E, GRADE B) ---- 35 KSI (MIN.)
---- 51 KSI (MAX.)

FOUNDATIONS

MAXIMUM FOUNDATION BEARING PRESSURE ---- 2.5 KSF
FOOTINGS ARE DESIGNED SUCH THAT A MINIMUM OF 75 PERCENT OF THE FOOTING IS ALWAYS IN CONTACT; A MAXIMUM OF 25 PERCENT OF THE FOOTING IS IN UPLIFT.

BEARING PILES SHALL BE CAST-IN-PLACE CONCRETE PILES WITH A MINIMUM BEARING CAPACITY EQUAL TO 5Ø KIPS.

CAMBER

PERMANENT CAMBER EQUAL TO L/1ØØØ HAS BEEN PROVIDED IN ADDITION TO THE DEAD LOAD CAMBER.

B. MATERIALS

I. STEEL

STEEL PIPE SHALL BE CERTIFIED BY MILL TEST REPORT TO MEET ASTM SPECIFICATION A53, TYPE E OR S, GRADE B WITH THE EXCEPTION THAT API 5L, GRADE B MAY BE USED WHEN THE SPECIFIED WALL THICKNESS IS GREATER THAN ½". ONLY ELECTRICAL RESISTANCE WELDED (ERW) MANUFACTURED SINGLE SEAM PIPE IS PERMITTED. HOWEVER, WHEN THE REQUIRED PIPE SIZE IS GREATER THAN 24", DOUBLE SEAM PIPE MAY BE USED. A MILL TEST REPORT MUST BE PROVIDED, CERTIFIED AND SIGNED BY THE PIPE MANUFACTURER, CONTAINING PHYSICAL AND CHEMICAL PROPERTIES AND THE MANUFACTURING PROCESS USED TO PRODUCE THE PIPE.

ALL OTHER STEEL SHALL CONFORM TO ASTM SPECIFICATION A36 GRADE 36 OR AASHTO M27Ø GRADE 5Ø (ASTM A7Ø9). ALL THIS SPECIFICATION STEEL SHALL MEET SUPPLEMENTARY REQUIREMENTS FOR NOTCH TOUGHNESS (CHARPY TESTING, ZONE #2)

REFER TO SUBSECTION 5Ø9.Ø2 OF THE NJDOT STANDARD SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

UPON COMPLETION OF FABRICATION, THE FABRICATOR SHALL PROVIDE A NOTARIZED CERTIFICATION OF COMPLIANCE AS PER SECTION 1Ø6.Ø4 OF THE NJDOT STANDARD SPECIFICATIONS, INCLUDING A LEGIBLE COPY OF ALL MILL TEST REPORTS FOR MATERIALS INCORPORATED INTO THE WORK.

STEEL ANCHOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM SPECIFICATION F1554, GRADE 36. THE ANCHOR BOLTS SHALL BE HOT DIP GALVANIZED AS PER ASTM SPECIFICATION A153, CLASS C.

CHORD SPLICE ASSEMBLY FASTENERS SHALL BE HIGH STRENGTH STEEL CONFORMING TO ASTM SPECIFICATION A325 AND SHALL BE HOT DIP GALVANIZED AS PER ASTM SPECIFICATION A153, CLASS C. ALL OTHER FASTENERS SHALL BE STAINLESS STEEL CONFORMING TO ASTM SPECIFICATION A32Ø, GRADE B8, CLASS 1.

CAPS FOR THE ENDS OF CHORDS AND TOPS OF POSTS SHALL BE STEEL CONFORMING TO ASTM SPECIFICATION A36 AND SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM SPECIFICATION A123.

WELDING OF STEEL SHALL BE AS SPECIFIED IN THE CONSTRUCTION SPECIFICATIONS.

AFTER COMPLETE FABRICATION, EACH STEEL SECTION SHALL BE HOT DIP GALVANIZED ACCORDING TO THE REQUIREMENTS OF ASTM SPECIFICATION A123, AS MODIFIED BY THE CONSTRUCTION SPECIFICATIONS. A SINGLE DIP GALVANIZING PROCESS IS PREFERRED IF SIZE PERMITS.

II. ALUMINUM

ALUMINUM SHALL CONFORM TO THE ASTM SPECIFICATIONS AND ALLOYS LISTED BELOW:

APPLICATION	ASTM SPECIFICATION	ASTM ALLOY
ROLLED OR EXTRUDED SHAPES	B3Ø8	6Ø61 - T6
PLATES	B2Ø9	6Ø61 - T6
DRAWN SEAMLESS TUBES	B21Ø	6Ø61 - T6
EXTRUDED TUBES	B221	6Ø61 - T6

WELDING OF ALUMINUM SHALL BE AS SPECIFIED IN THE CONSTRUCTION SPECIFICATIONS.

THE SIGN PANEL SHALL BE INSTALLED LEVEL. THE CONTRACTOR SHALL FIELD DRILL THE SIGN SUPPORTS AS REQUIRED TO ACHIEVE THIS.

III. REINFORCEMENT STEEL

ALL REINFORCEMENT STEEL SHALL BE ASTM A615, GRADE 6Ø.

IV. CONCRETE

ALL CONCRETE SHALL BE "CONCRETE IN STRUCTURES, FOOTINGS", UNLESS OTHERWISE SPECIFIED BY THE DESIGNER.

STATE	FEDERAL PROJECT NO.
N.J.	

SIGN STRUCTURE DRG. OH-D1

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

OVERHEAD SIGN SUPPORT STRUCTURES GENERAL NOTES, PLAN AND ELEVATIONS

ROUTE: SECTION:

SCALE : NONE

BRIDGE
SHEET NO. OF

PROOF 03 - ORIGINAL SHEET

STATE	FEDERAL PROJECT NO.
N.J.	

OVERHEAD SIGN SUPPORTS (STEEL TRUSSES AND STEEL TOWERS)

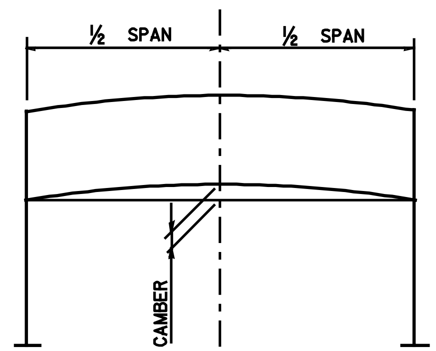
SIGN SUPPORTS		ELEVATIONS			SPAN LENGTH (FT)	TRUSSES							TOWERS			
STRUCTURE No.	STATION	℄ TRUSS	BOT OF BASE PLATE LEFT	BOT OF BASE PLATE RIGHT		A x B (FT)	CHORDS O.D.xTHICK (IN)	DIAGONALS O.D.xTHICK (IN)	STRUTS O.D.xTHICK (IN)	END STRUTS O.D.xTHICK (IN)	No. OF TRUSS UNITS	CAMBER (IN)	D (FT-IN)	SHAFTS O.D.xTHICK (IN)	DIAGONALS O.D.xTHICK (IN)	STRUTS O.D.xTHICK (IN)

NOTES:

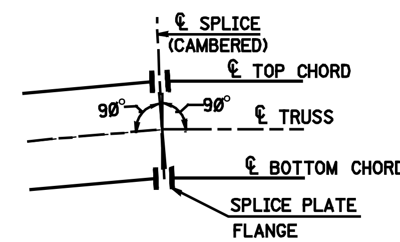
1. ALL ELEVATIONS SHALL BE VERIFIED IN THE FIELD PRIOR TO FABRICATION AND CONSTRUCTION.
2. LEFT AND RIGHT TOWERS ARE DEFINED LOOKING UPSTATION.
3. THE NUMBER OF TRUSS UNITS SHOWN IN THE SCHEDULE OF STRUCTURES IS OPTIONAL. ALTERNATES MAY BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
4. THE DIAGONALS ON EACH FACE OF THE TRUSS MUST FORM CONTINUOUS TRUSSING BETWEEN TOWERS (SEE TYPICAL PLAN AND ELEVATION VIEWS ON SIGN STRUCTURE DRG. OH-D1).

SUMMARY OF QUANTITIES

PAY ITEM NO.	STADARD ITEM NO.	DESCRIPTION	UNIT	CONTRACT QUANTITY



CAMBER REQUIRED



CAMBER DETAIL

CAMBER NOTE:

CAMBER SHALL BE OBTAINED BY INCREASING THE TOP CHORD LENGTH AND DECREASING THE BOTTOM CHORD LENGTH AS SHOWN. CHORD SPLICE FLANGES SHALL BE SKEWED TO THE ANGLE SO OBTAINED BEFORE WELDING TO CHORDS. NO FORCE SHALL BE APPLIED IN PROVIDING CAMBER. AN ALTRNATE METHOD OF OBTAINING CAMBER MAY BE USED AS APPROVED BY THE ENGINEER.

CONTROL SECTION	______	JOB NO. ______
DES. BY		CHK. BY
DWN. BY		
EST. BY		CHK. BY
SPECS. BY		
IN CHARGE OF ______		

SIGN STRUCTURE DRG. OH-D2

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

OVERHEAD SIGN SUPPORT STRUCTURES
SCHEDULE OF STRUCTURES

ROUTE: SECTION:

SCALE : NONE

BRIDGE SHEET NO. OF

STATE	FEDERAL PROJECT NO.
N.J.	

OVERHEAD SIGN SUPPORTS - SCHEDULE OF FOUNDATIONS

STRUCTURE No.	FOOTINGS													PEDESTALS (SEE NOTE 7)									BARRIER PEDESTALS																					TOTAL WEIGHT OF COR. PROTECTED REBARS (LBS)	TOTAL WEIGHT OF ALL REBAR TYPES (LBS)	TOTAL VOLUME OF CONC (C.Y.)
	SIZE FLxFW (FT)	VOLUME				No. OF PILES IN ROW		PILE LGTH (FT)	REINFORCING BARS				WT OF RE-BARS (LBS)	SIZE PD (FT)	PED HT (FT)	VOL OF CONC (C.Y.)	REINFORCING BARS				WEIGHT OF COR. PROTE-CTED REBARS (LBS)	SIZE BWT (FT)	BAR-RIER HT (FT)	BAR-RIER LGTH (FT)	VOL OF CONC (C.Y.)	REINFORCING BARS																WEIGHT OF COR. PROTE-CTED REBARS (LBS)			
		CONCRETE		EXCAVATION					No. & SIZE								TYPE "P-1"			TYPE "P-2"					TYPE "B-1"			TYPE "B-2"				TYPE "B-3"					TYPE "B-4"									
		WITH PILES (C.Y.)	W/O PILES (C.Y.)	WITH PILES (C.Y.)	W/O PILES (C.Y.)	"X"	"Y"		FLB	FWB	FLT	FWT					No. & SIZE	A (FT-IN)	LGTH (FT-IN)	No. & SIZE	D (FT-IN)	LGTH (FT-IN)						No. & SIZE	A (FT-IN)	LGTH (FT-IN)	No. & SIZE	B (FT-IN)	C (FT-IN)	LGTH (FT-IN)	No. & SIZE	E (FT-IN)	F (FT-IN)	LGTH (FT-IN)	No. & SIZE	E (FT-IN)	G (FT-IN)	LGTH (FT-IN)						

BARRIER HEIGHT +1'-6" | A

TYPE "B-1"

B, C, 8, 1

TYPE "B-2"

E, F

TYPE "B-3"

E, G

TYPE "B-4"

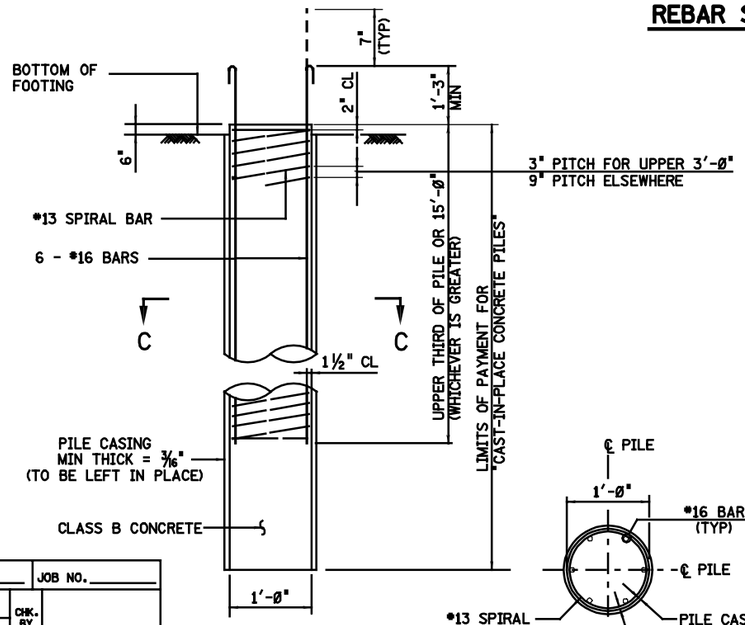
PEDESTAL HEIGHT +1'-6" | A

TYPE "P-1"

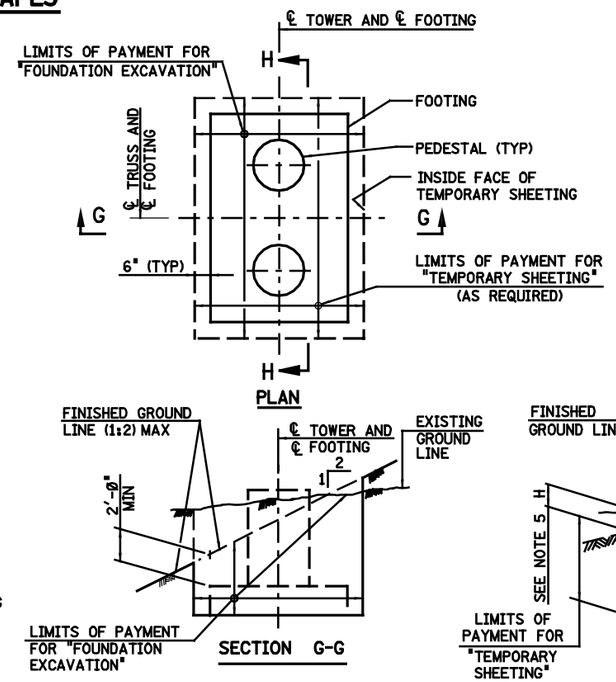
1'-6", D

TYPE "P-2"

REBAR SHAPES



CAST-IN-PLACE CONCRETE PILE



TEMPORARY SHEETING AND EXCAVATION DETAILS

NOTES:

1. BEARING PILES SHALL BE CAST-IN-PLACE CONCRETE PILES. ALL PILES SHALL BE 1'-Ø" IN DIAMETER OR EQUIVALENT AND SHALL HAVE A MINIMUM BEARING CAPACITY OF 5Ø KIPS. THE NUMBER AND SPACING OF PILES SHALL BE AS INDICATED ON SIGN STRUCTURE DRG. OH-D4.
2. PILE DESIGN SHALL CONFORM TO AASHTO SPECIFICATIONS FOR THE SEISMIC DESIGN OF HIGHWAY BRIDGES, SEISMIC PERFORMANCE CATEGORY B, SUBSECTION 6.3.1(C)
3. APPROVED METAL SPACERS SHALL BE ATTACHED TO TOP AND BOTTOM SPIRALS TO ENSURE THAT THE REQUIRED CLEAR DISTANCE TO THE CASING IS MAINTAINED.
4. NO CONCRETE SHALL BE PLACED IN CAST-IN-PLACE PILES UNTIL AFTER ALL PILE CASINGS FOR THE FOOTING HAVE BEEN DRIVEN.
5. WHEN TEMPORARY SHEETING IS REQUIRED, H IS 3'-Ø" WHEN ADJACENT TO PEDESTRIAN OR VEHICULAR TRAFFIC AND 1'-Ø" MINIMUM FOR ALL OTHER CONDITIONS.
6. PAYMENT LIMITS FOR TEMPORARY SHEETING SHALL BE MEASURED FROM THE FINISHED GRADE LINE OR FROM THE EXISTING GROUND LINE, WHICHEVER IS LOWER.
7. QUANTITIES SHOWN ARE FOR BOTH PEDESTALS.

CONTROL SECTION		JOB NO.	
DES. BY		CHK. BY	
DWN. BY		CHK. BY	
EST. BY		CHK. BY	
SPECS. BY			

IN CHARGE OF

BRDGD 03 ORIGINAL SHEET

SIGN STRUCTURE DRG. OH-D3

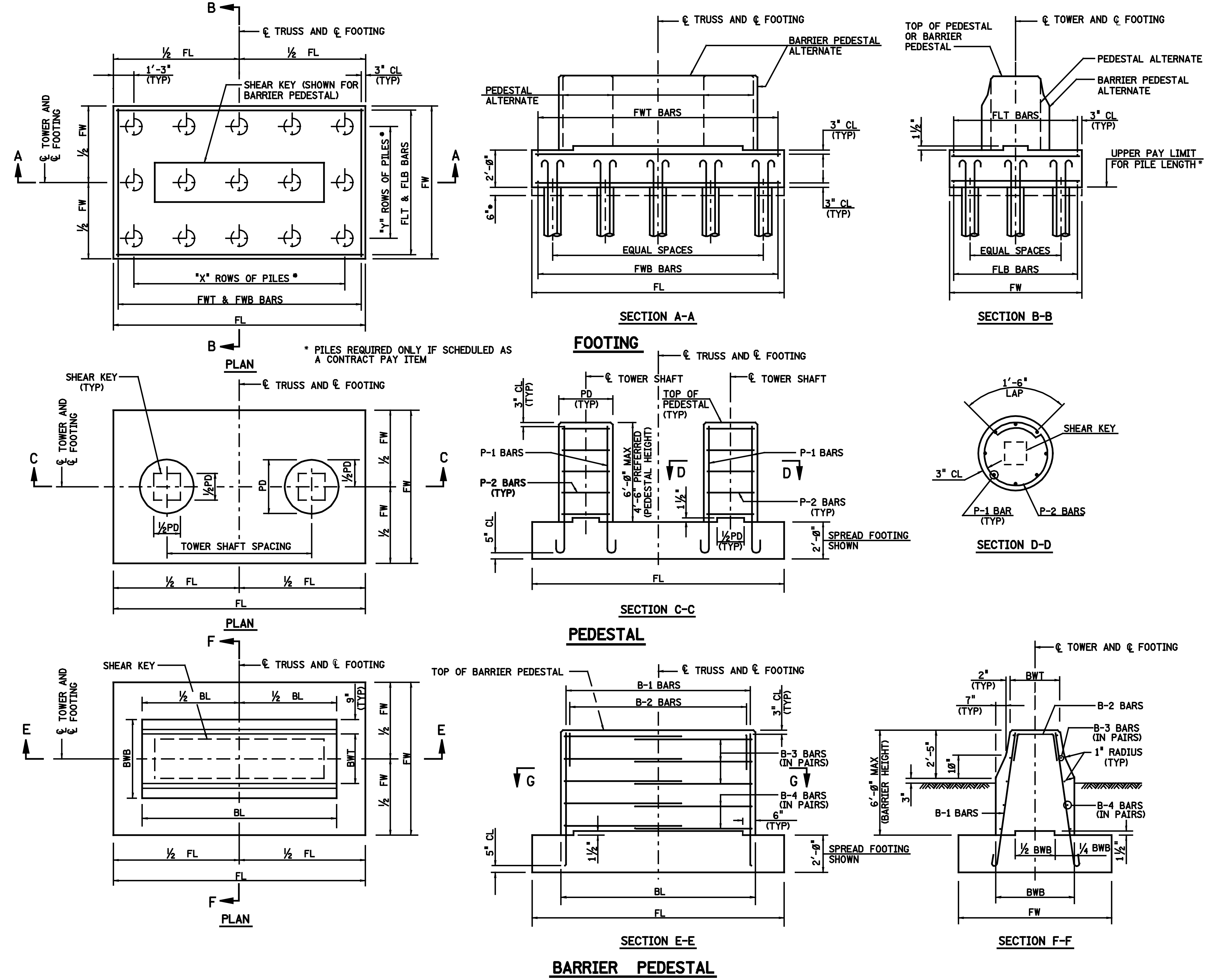
NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

OVERHEAD SIGN SUPPORT STRUCTURES SCHEDULE OF FOUNDATIONS AND MISCELLANEOUS DETAILS

ROUTE: SECTION:

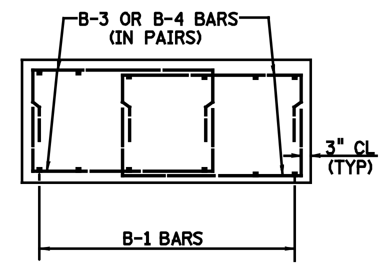
SCALE : NONE

BRIDGE SHEET NO. OF



NOTES:

1. ALL REINFORCEMENT IN PEDESTALS OR BARRIER PEDESTALS SHALL BE CORROSION PROTECTED.
2. EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 1"x1" UNLESS NOTED OTHERWISE.
3. BARS SHALL NOT BE SPLICED EXCEPT AS PROVIDED ON THIS DRAWING OR AUTHORIZED BY THE ENGINEER. WHEN SPLICING IS APPROVED, THE REINFORCEMENT BARS SHALL BE LAPPED FOR A LENGTH OF AT LEAST 36 DIAMETERS AND SHALL BE SECURELY WIRED TOGETHER.
4. FOR DETAILS OF CAST-IN-PLACE CONCRETE PILES, SEE SIGN STRUCTURE DRG. OH-D3..



SECTION G-G

STATE	FEDERAL PROJECT NO.
N.J.	

SIGN STRUCTURE DRG. OH-D4

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

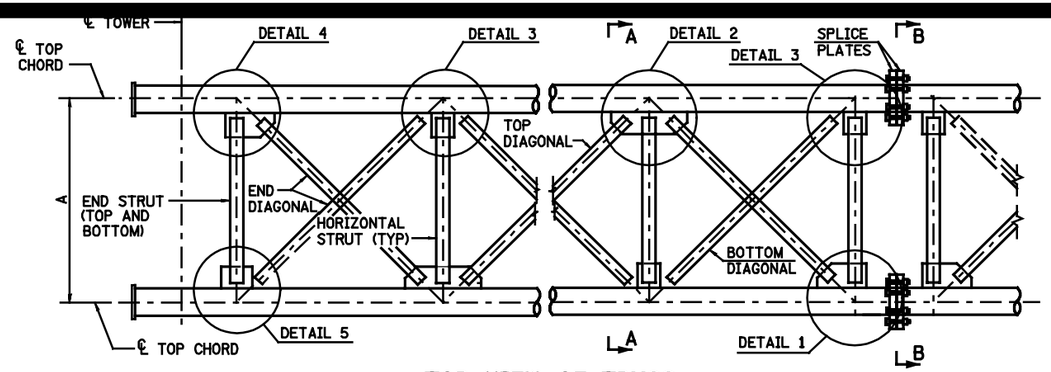
OVERHEAD SIGN SUPPORT STRUCTURES
FOUNDATION DETAILS

ROUTE: SECTION:

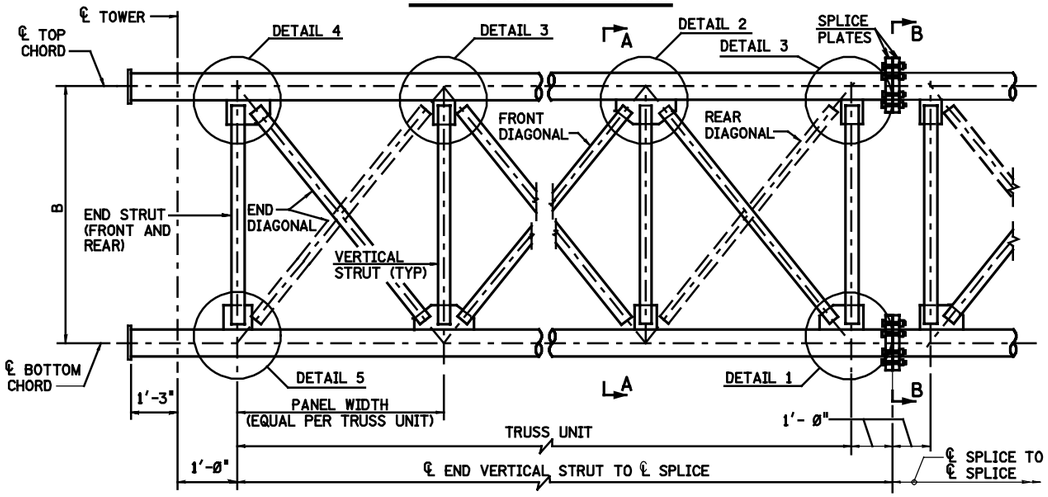
SCALE : NONE

BRIDGE SHEET NO. OF

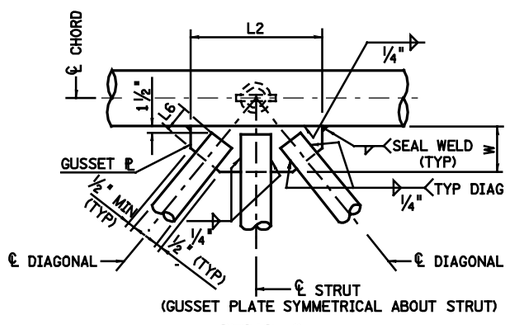
BDC02D-03 – ORIGINAL SHEET



TOP VIEW OF TRUSS

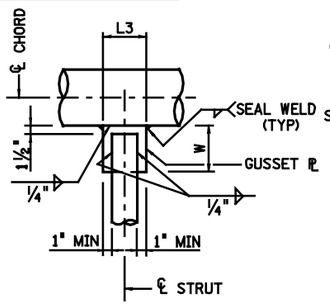


FRONT VIEW OF TRUSS

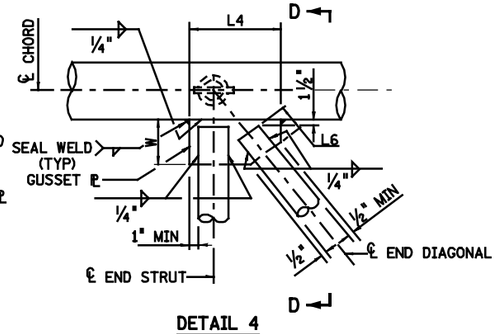


(GUSSET PLATE SYMMETRICAL ABOUT STRUT)

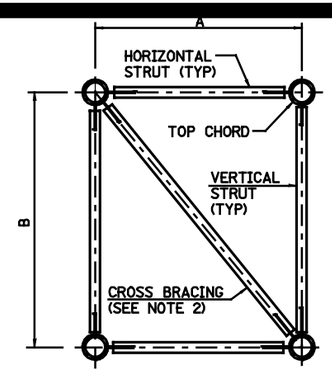
DETAIL 2



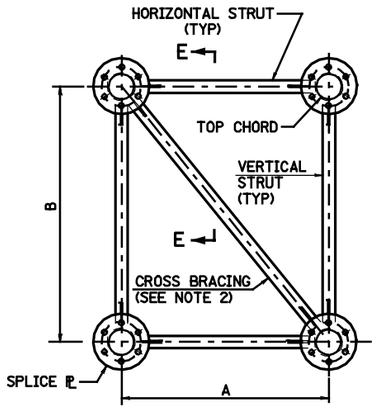
DETAIL 3



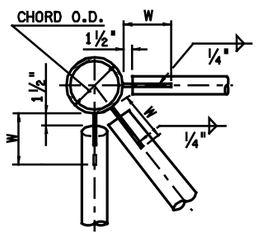
DETAIL 4
(END 'K' GUSSET)
(SEE COPE HOLE DETAIL)



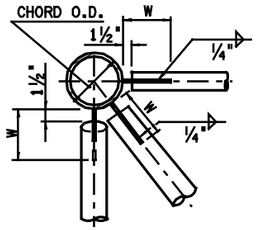
SECTION A-A



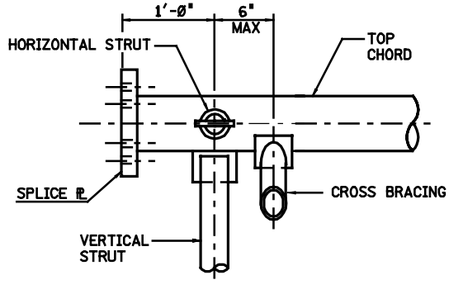
SECTION B-B



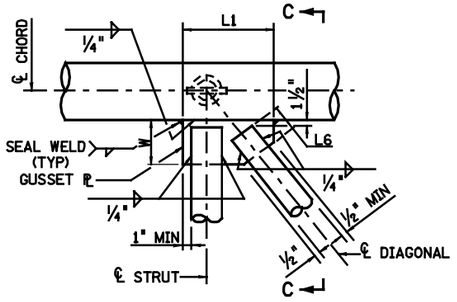
SECTION C-C



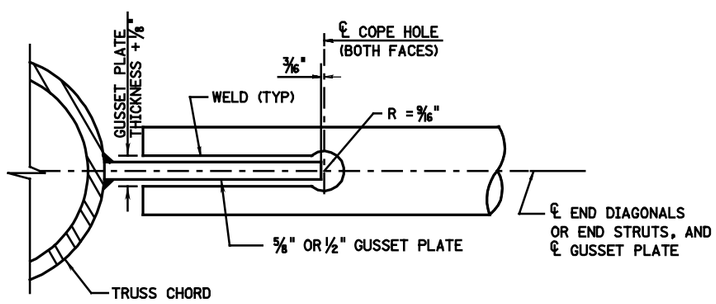
SECTION D-D



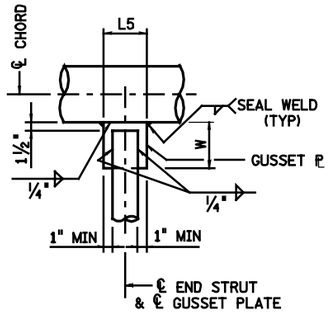
SECTION E-E



DETAIL 1



COPE HOLE DETAIL



DETAIL 5
(END 'T' GUSSET)
(SEE COPE HOLE DETAIL)

NOTE:

COPE HOLES TO BE PROVIDED AT BOTH ENDS AND BOTH FACES OF ALL END STRUTS AND END DIAGONALS (8 STRUTS TOTAL, 8 DIAGONALS TOTAL).

TRUSS GUSSET PLATE DIMENSIONS

CHORD O.D. (IN)	PLATE THICKNESS	PLATE WIDTH W	"K" GUSSET MIN. L1	"K-T" GUSSET MIN. L2	"T" GUSSET MIN. L3	"END - K" GUSSET MIN. L4	"END - T" GUSSET MIN. L5	WELD LENGTH MIN. L6
3.500	½"	6½"	10"	1'-2"	5½"	10"	5½"	3½"
4.000	½"	6½"	10"	1'-2"	5½"	10"	5½"	3½"
4.500	½"	6½"	10"	1'-2"	5½"	10"	5½"	3½"
5.563	½"	6½"	10"	1'-2"	5½"	10"	5½"	3½"
6.625	⅝"	7"	10⅜"	1'-3"	5½"	1'-0"	5½"	4"
8.625	⅝"	7½"	11¼"	1'-5"	5½"	1'-0⅜"	5½"	4¾"
10.750	⅝"	8"	1'-0¼"	1'-7"	5½"	1'-4"	5½"	5"
12.750	⅝"	8½"	1'-1"	1'-8½"	5½"	1'-4"	5½"	5½"
14.000	⅝"	8½"	1'-1½"	1'-9½"	5½"	1'-4½"	5½"	5½"

NOTES:

1. THE SIZE OF CROSS BRACING MEMBERS SHALL BE THE SAME AS THAT OF THE DIAGONALS. CROSS BRACING SHALL BE LOCATED AT THE ENDS OF EACH TRUSS UNIT AND SPACED AT EVERY THIRD PANEL MAXIMUM, ALTERNATING IN DIRECTION.
2. FOR CHORD CAP DETAILS, SEE SIGN STRUCTURE DRG. OH-D8.
3. FOR CHORD SPLICES, SEE SIGN STRUCTURE DRG. OH-D6.
4. THE LENGTHS SHOWN IN THE TABLE FOR THE TRUSS GUSSET PLATE ARE ABSOLUTE MINIMUM DIMENSIONS. THE ACTUAL DIMENSIONS REQUIRED WILL DEPEND ON THE PANEL DEPTH AND WIDTH USED.

STATE	FEDERAL PROJECT NO.
N.J.	

SIGN STRUCTURE DRG. OH-D5

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

OVERHEAD SIGN SUPPORT STRUCTURES
STEEL TRUSS DETAILS - SHEET 1

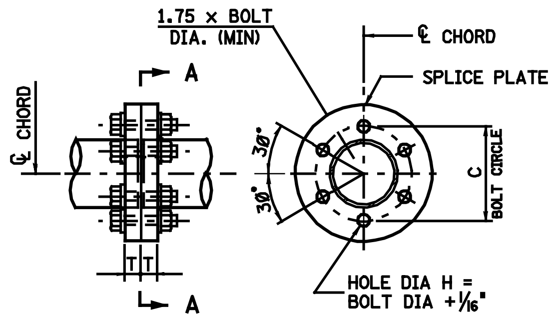
ROUTE: SECTION:

SCALE : NONE

BRIDGE
SHEET NO. OF

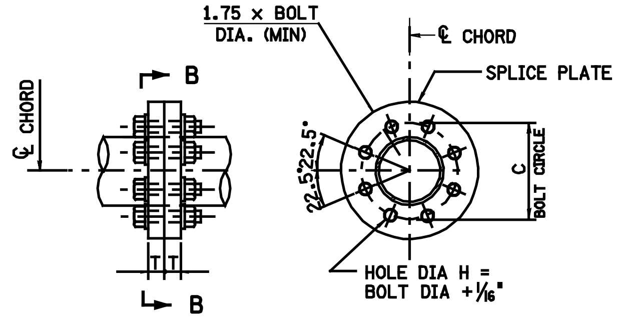
ORIGINAL SIZE

STATE	FEDERAL PROJECT NO.
N.J.	



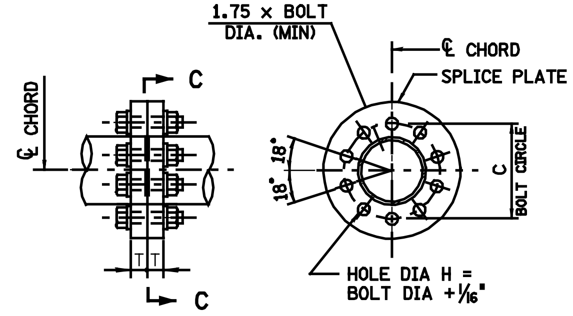
ELEVATION SECTION A-A

SIX-BOLT CHORD SPLICE DETAIL



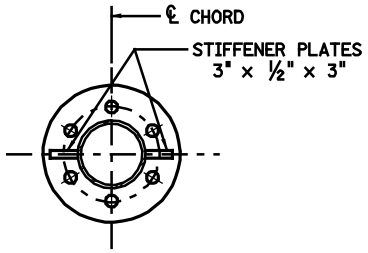
ELEVATION SECTION B-B

EIGHT-BOLT CHORD SPLICE DETAIL



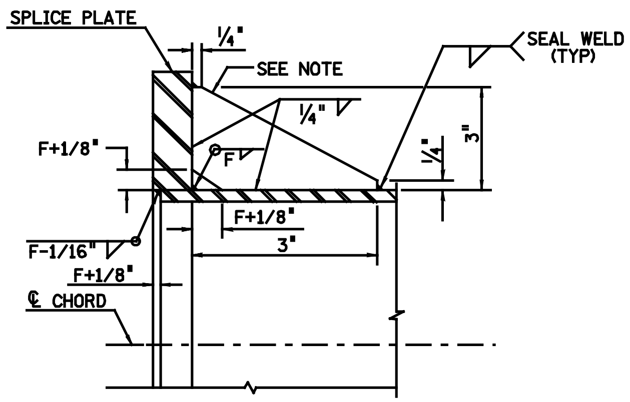
ELEVATION SECTION C-C

TEN-BOLT CHORD SPLICE DETAIL



CHORD SPLICE WITH STIFFENERS

(SIX-BOLT SPLICE SHOWN)



CHORD SPLICE WELD DETAIL

NOTES:

1. CHORD SPLICE STIFFENER PLATES ARE TO BE USED FOR CHORD SPLICES LOCATED AT MIDSPAN (CENTERLINE) OF TRUSS ONLY. (SEE CHORD SPLICE ASSEMBLY WELD DETAIL FOR MORE INFORMATION).

2. CHORD SPLICE STIFFENER PLATES ARE SHOWN HORIZONTAL. STIFFENER PLATES MAY BE REPOSITIONED, AS NECESSARY, TO PROVIDE SUFFICIENT CLEARANCE FOR BOLTING OF THE SPLICE, BUT THEY SHALL ALWAYS BE POSITIONED OPPOSITE TO EACH OTHER AS SHOWN.

NOTES:

1. A325 SPLICE BOLTS SHALL BE HEAVY HEXAGON TYPE AND SHALL BE FURNISHED WITH HEAVY HEXAGON NUTS AND WASHERS.

2. THE THREADED PORTION OF THE SPLICE BOLTS SHALL BE EXCLUDED FROM THE SHEAR PLANE OF THE SPLICE.

3. THE PROVISIONS OF SUBSECTION 5Ø9.Ø9 OF THE NJDOT STANDARD SPECIFICATIONS SHALL BE FOLLOWED IN FURNISHING THE REQUIRED CHORD SPLICE ASSEMBLY.

4. REFER TO SUBSECTION 5Ø9.Ø8 OF THE NJDOT STANDARD SPECIFICATIONS FOR SPLICE BOLT TIGHTENING PROCEDURES. WHEN CALIBRATED WRENCHES ARE USED FOR BOLT INSTALLATION, THEY SHALL BE SET TO PROVIDE THE TENSION THAT IS SPECIFIED IN THE TABLE ABOVE.

TRUSS CHORD SPLICES

CHORD O.D.xTHICK (IN)	SPLICE PLATES THICKNESS T	SPLICE PLATES WELD SIZE F	SPLICE BOLTS No. OF BOLTS	SPLICE BOLTS BOLT CIRCLE C	SPLICE BOLTS DIAMETER	SPLICE BOLTS BOLT TENSION (KIPS)
3.5ØØx.216	1 1/2"	1/4"	6	6 1/8"	3/4"	28
4.ØØØx.226	1 1/2"	1/4"	6	6 5/8"	3/4"	28
4.5ØØx.237	1 1/2"	1/4"	6	7 1/8"	3/4"	28
5.563x.258	1 1/2"	9/32"	6	9"	1"	51
6.625x.28Ø	2"	9/32"	8	1Ø 1/8"	1"	51
8.625x.322	2"	5/16"	8	1'-1"	1 1/4"	71
1Ø.75Øx.365	2"	11/32"	8	1'-4"	1 1/2"	1Ø3
12.75Øx.375	2"	3/8"	1Ø	1'-6"	1 1/2"	1Ø3
14.ØØØx.375	2"	3/8"	1Ø	1'-7 1/4"	1 1/2"	1Ø3

SIGN STRUCTURE DRG. OH-D6

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

OVERHEAD SIGN SUPPORT STRUCTURES STEEL TRUSS DETAILS - SHEET 2

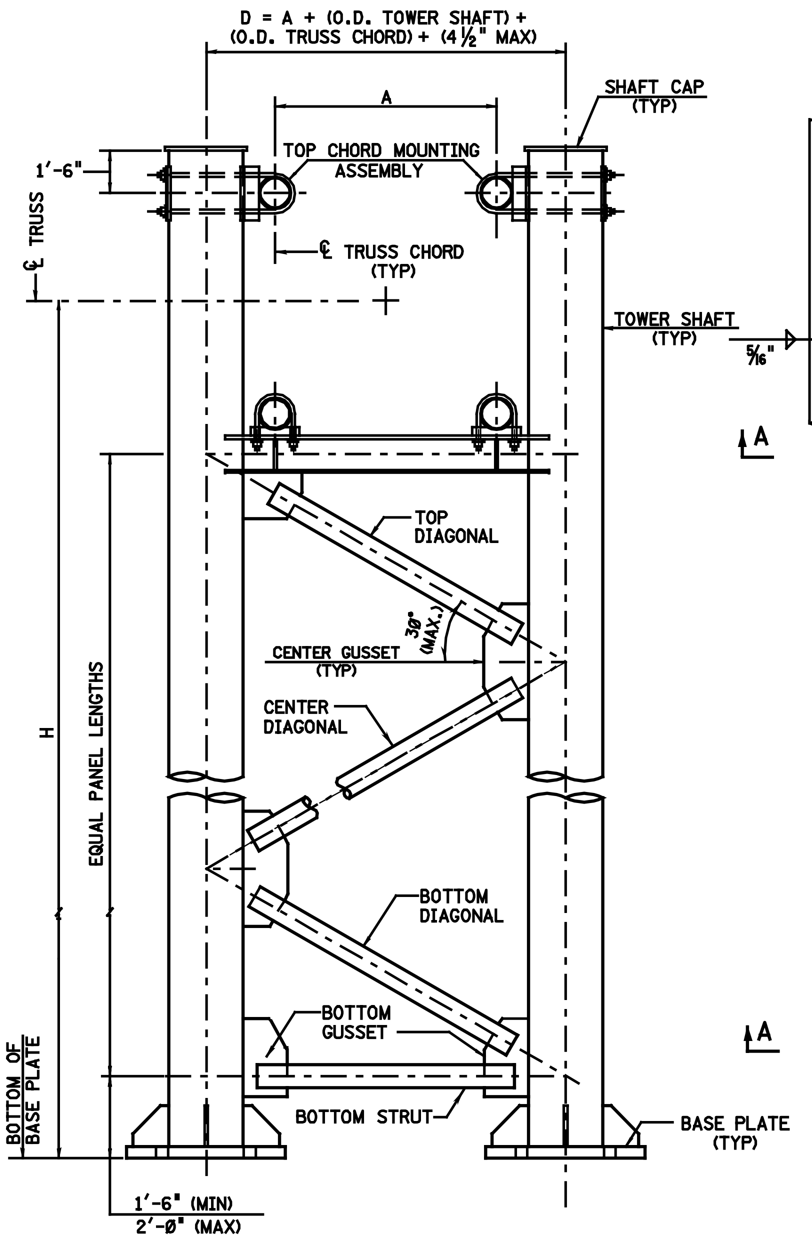
ROUTE: SECTION:

SCALE : NONE

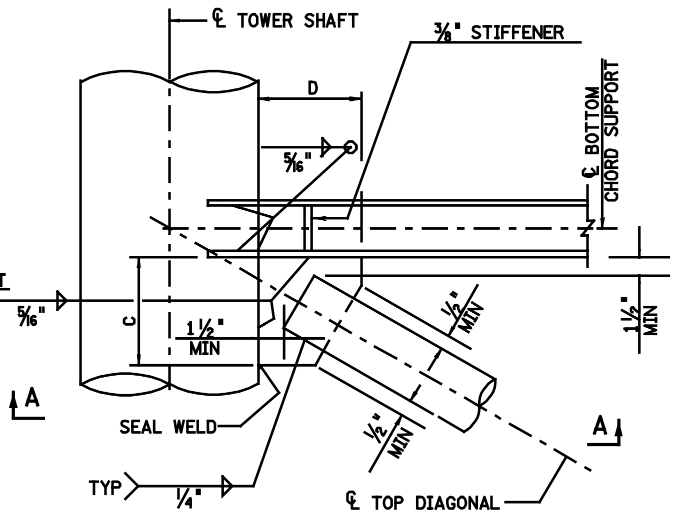
BRIDGE SHEET NO. OF

BDC02D-03 ORIGINAL SHEET

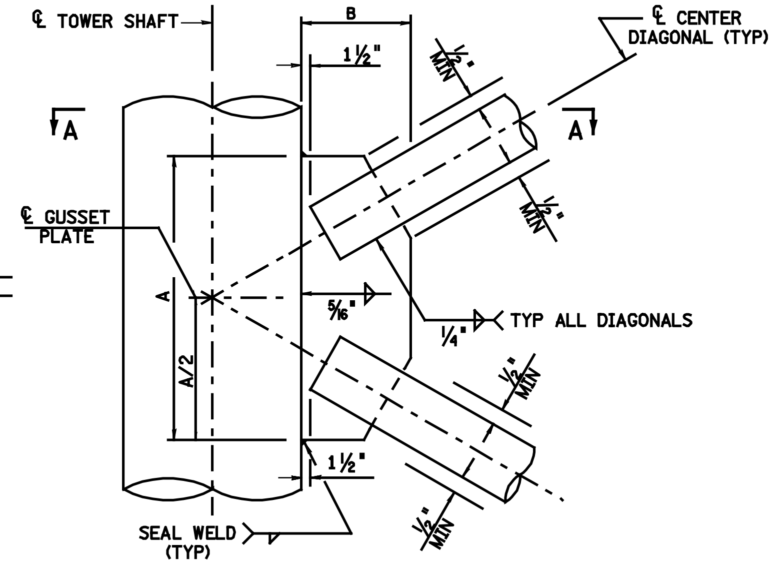
STATE	FEDERAL PROJECT NO.
N.J.	



TOWER ELEVATION

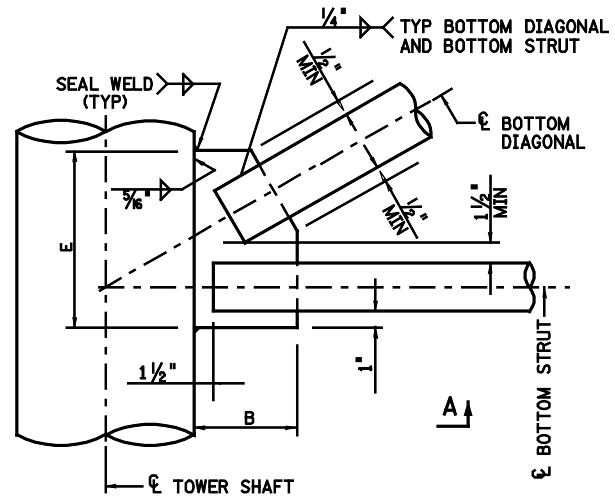


TOP GUSSET DETAIL

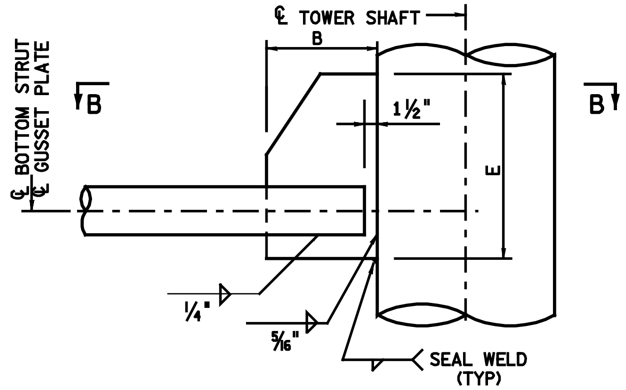


CENTER GUSSET DETAIL

⅞" GUSSET PLATES					
TOWER SHAFT O.D. (IN)	A (FT-IN)	B (IN)	C (IN)	D (IN)	E (IN)
10.750	1'-6"	7"	6¼"	12¼"	13"
12.750	1'-7½"	7¼"	7"	12¾"	13⅜"
14.000	1'-11"	9"	9½"	16"	17½"
16.000	2'-1⅝"	10¼"	11⅜"	16½"	17½"
18.000	2'-4"	11"	11⅜"	17¾"	19"
20.000	2' 5½"	11"	11⅜"	15½"	19"
22.000	2'-6½"	11"	12⅜"	15"	19"



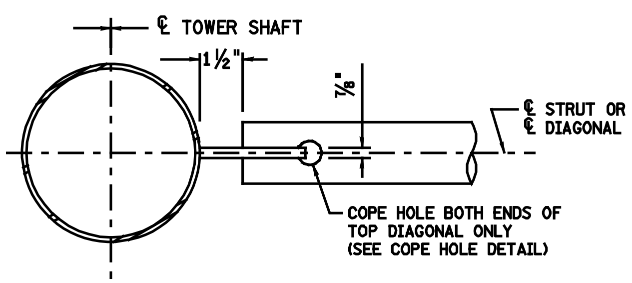
BOTTOM GUSSET DETAIL



BOTTOM GUSSET DETAIL

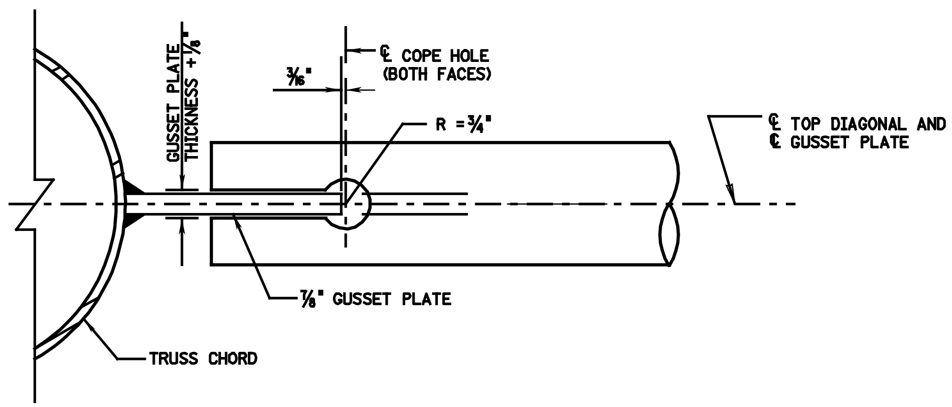
NOTES:

1. FOR DETAILS OF THE SADDLE BLOCK, SEE SIGN STRUCTURE DRG. OH-D8.
2. FOR TOWER SHAFT CAP DETAILS, SEE SIGN STRUCTURE DRG. OH-D8.
3. FOR DETAILS OF TOP AND BOTTOM CHORD MOUNTING ASSEMBLIES, SEE SIGN STRUCTURE DRG. OH-D8.
4. COPE HOLES SHALL BE PROVIDED ON BOTH FACES OF THE PIPE.



SECTION A-A

(SECTION B-B OPPOSITE HAND)



COPE HOLE DETAIL

SIGN STRUCTURE DRG. OH-D7

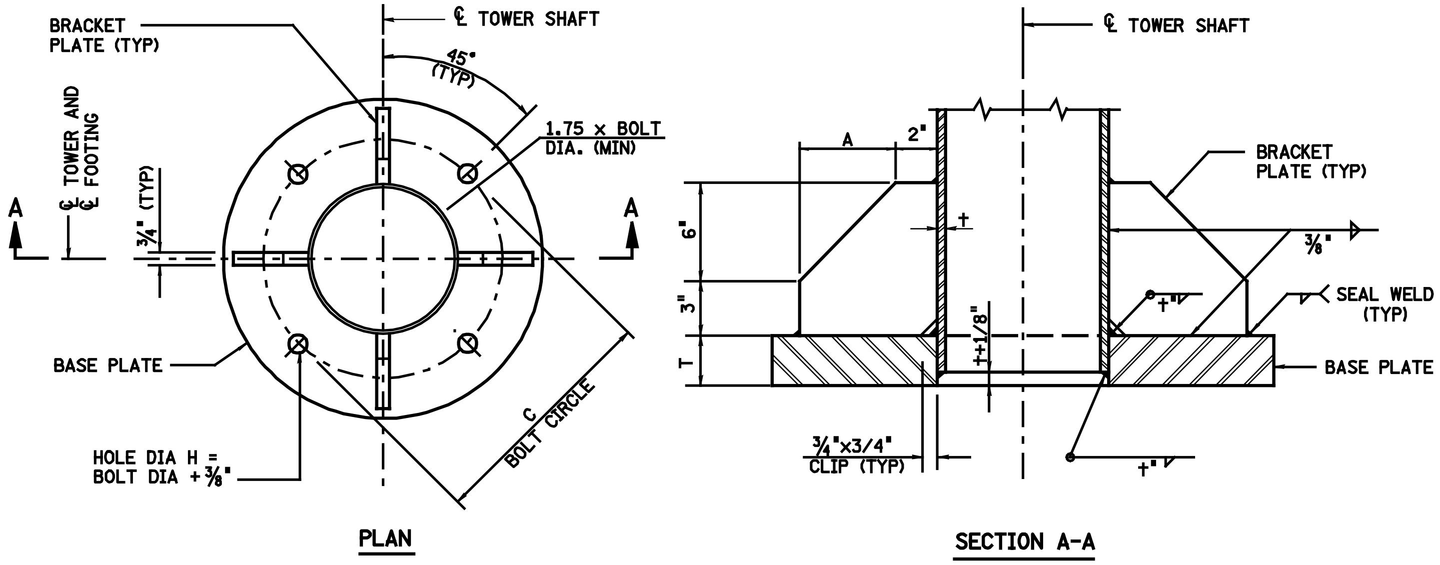
NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

OVERHEAD SIGN SUPPORT STRUCTURES
STEEL TOWER DETAILS

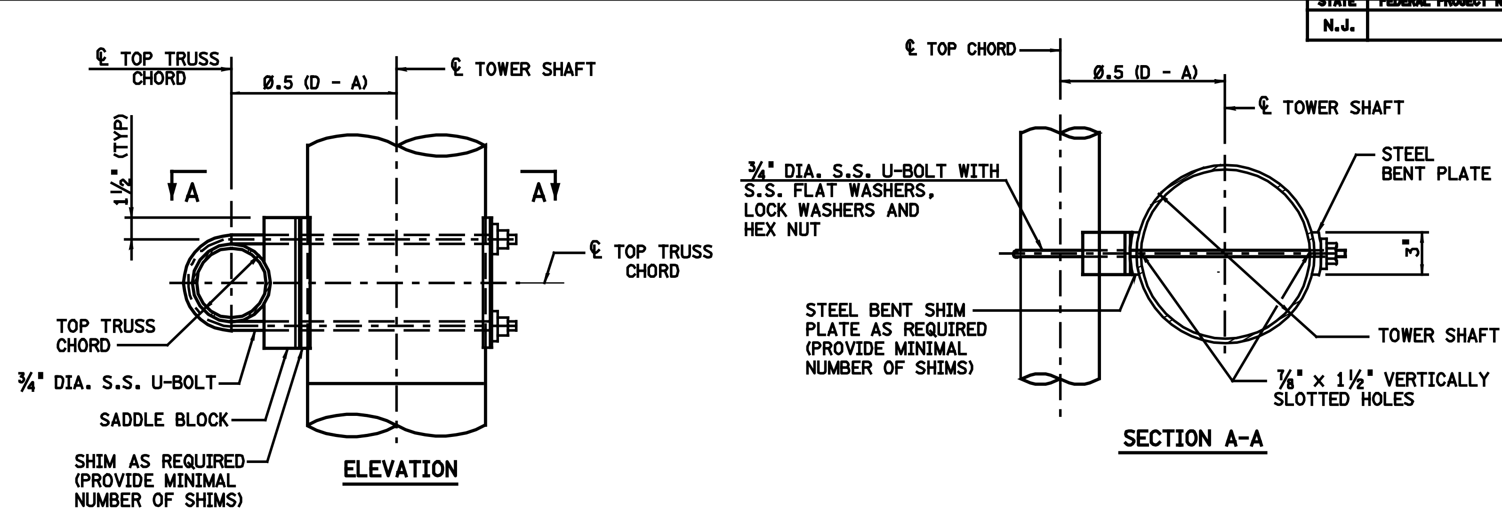
ROUTE: SECTION:

SCALE : NONE

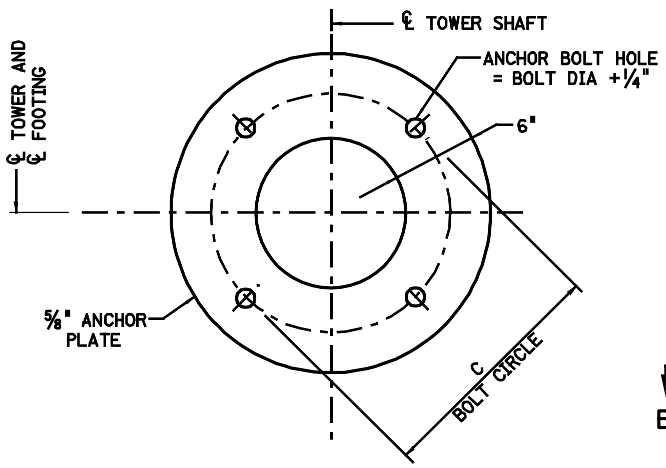
BRIDGE SHEET NO. OF



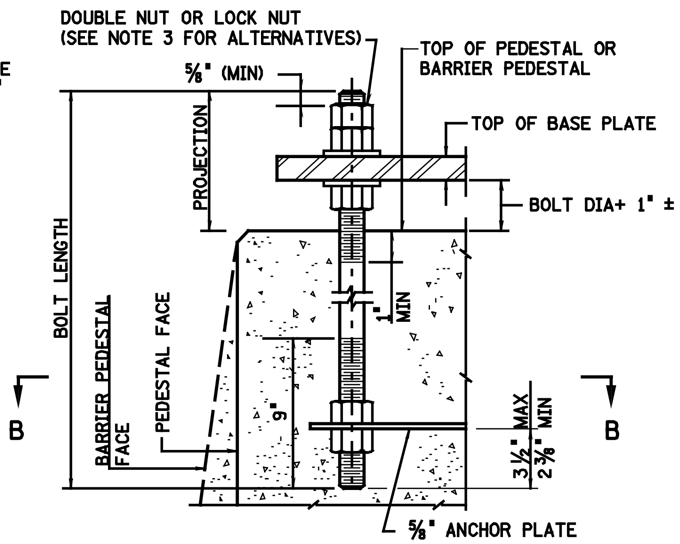
TOWER SHAFT BASE DETAIL



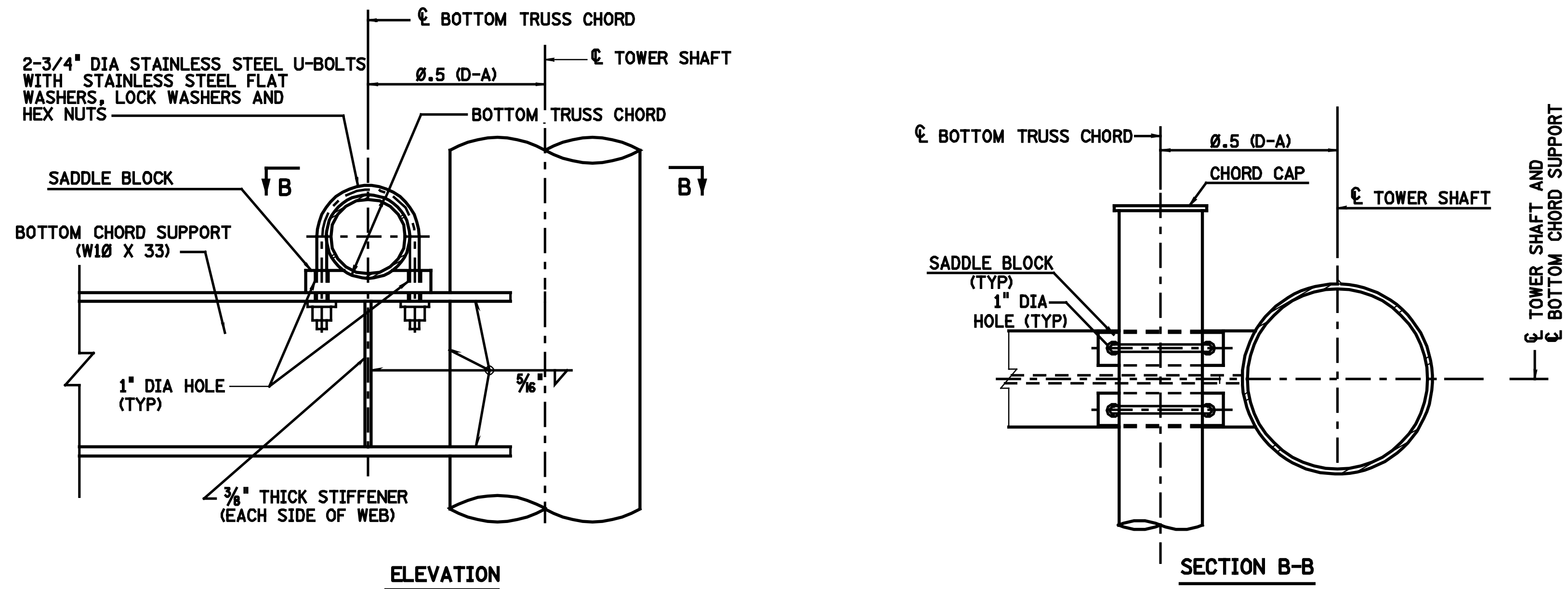
TOP CHORD MOUNTING ASSEMBLY DETAIL



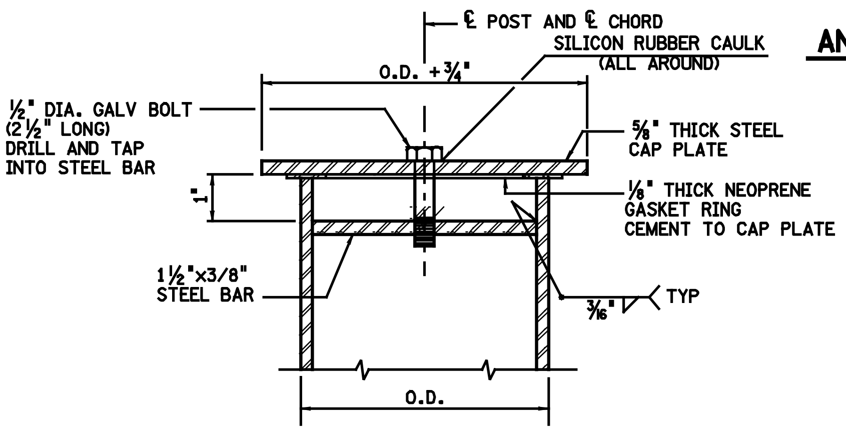
ANCHOR PLATE DETAIL



ANCHOR BOLT DETAIL



BOTTOM CHORD MOUNTING ASSEMBLY DETAIL

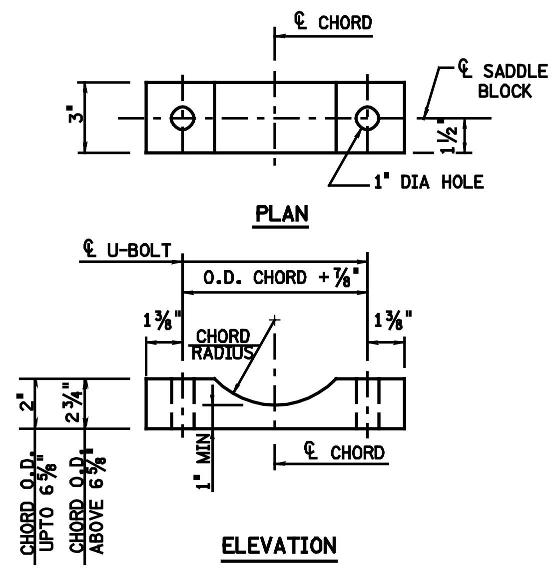


STEEL POST OR CHORD CAP DETAIL

NOTE: ALTERNATE CAP DETAILS MAY BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

TOWER SHAFT BASE ASSEMBLY						
TOWER SHAFT O.D.xTHICK (IN)	BASE PLATE	ANCHOR BOLTS				BRACKET PLATES
	THICKNESS T	BOLT CIRCLE C	SIZE DIAxLGTH	BOLT TENSION (KIPS)	PROJ•	A
1Ø.75Øx.365	2"	1'-5 1/4"	1 3/4"X48"	77	9 1/2"	2 3/8"
12.75Øx.375	2 1/4"	1'-8 5/8"	2"X54"	1Ø2	1Ø 1/4"	3 3/8"
14.ØØØx.375	2 1/4"	1'-9 3/8"	2 3/4"X67"	162	12"	4"
14.ØØØx.5ØØ	2 1/2"	1'-9 3/8"	2 3/4"X68"	162	12 1/4"	4"
16.ØØØx.375	2 1/2"	2'-1 3/8"	2 3/4"X68"	162	12 1/4"	5"
16.ØØØx.5ØØ	2 3/4"	2'-1 3/8"	2 3/4"X68"	162	12 5/8"	5"
18.ØØØx.375	2 3/4"	2'-4 3/4"	2 3/4"X72"	2ØØ	13"	6"
18.ØØØx.5ØØ	2 3/4"	2'-4 3/4"	2 3/4"X72"	2ØØ	13"	6"
2Ø.ØØØx.5ØØ	3 1/4"	2'-8 1/8"	3"X78"	242	14"	7"
2Ø.ØØØx.5ØØ	3 1/4"	3'-1/8"	3"X78"	242	14"	8"

• PROJECTION LENGTH SHOWN IS BASED ON USING DOUBLE NUTS.



SADDLE BLOCK DETAIL

NOTES:

1. ANCHOR BOLTS SHALL BE PROVIDED WITH HEAVY HEXAGON NUTS AND TWO WASHERS AS SHOWN ON THE ANCHOR BOLT DETAIL.
2. ANCHOR BOLTS SHALL BE GALVANIZED AFTER THREADING.
3. REFER TO SUBSECTION 5Ø9.Ø8 OF THE NJDOT STANDARD SPECIFICATIONS FOR ANCHOR BOLT TIGHTENING PROCEDURES. WHEN CALIBRATED WRENCHES ARE USED FOR BOLT INSTALLATION, THEY SHALL BE SET TO PROVIDE THE TENSION THAT IS SPECIFIED IN THE TABLE ABOVE.
4. 3/4" STAINLESS STEEL U-BOLTS SHALL HAVE THE THREADS EXCLUDED FROM THE SHEAR PLANE BETWEEN THE SADDLE BLOCK AND BOTTOM CHORD SUPPORT.

STATE | FEDERAL PROJECT NO.
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SIGN STRUCTURE DRG. OH-D8

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

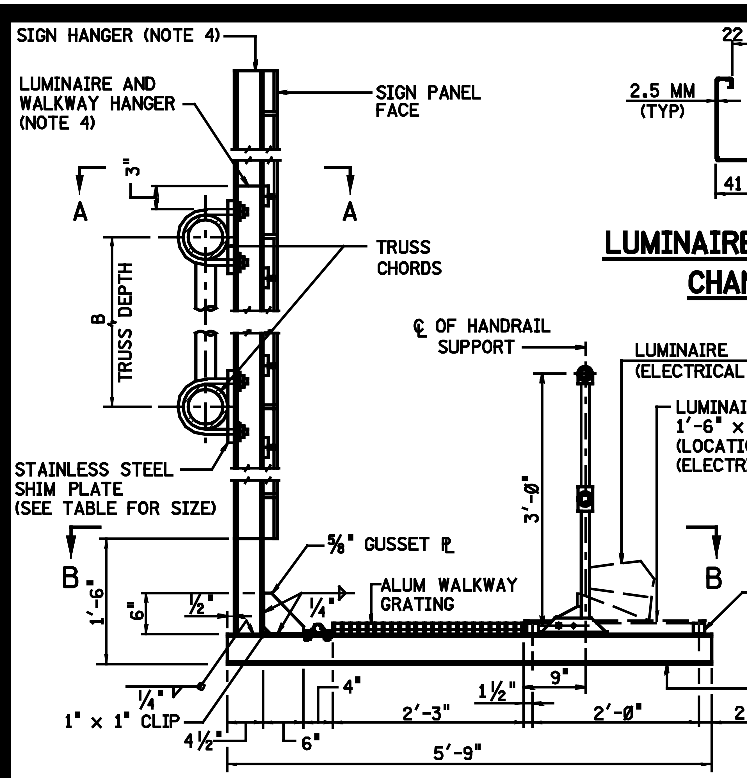
OVERHEAD SIGN SUPPORT STRUCTURES
TOWER SHAFT BASE AND TRUSS SEAT DETAILS

ROUTE: SECTION:

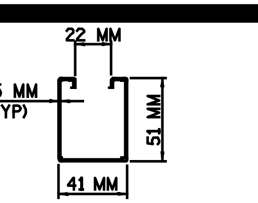
SCALE : NONE

BRIDGE SHEET NO. OF

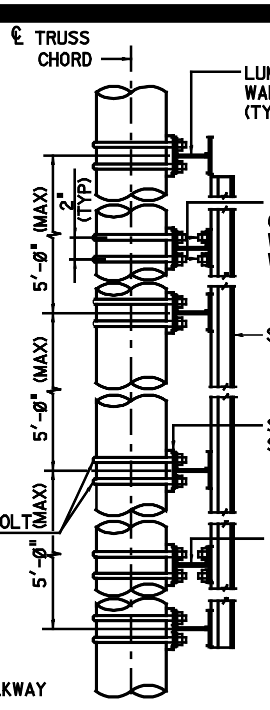
BDC02D-03 – ORIGINAL SHEET



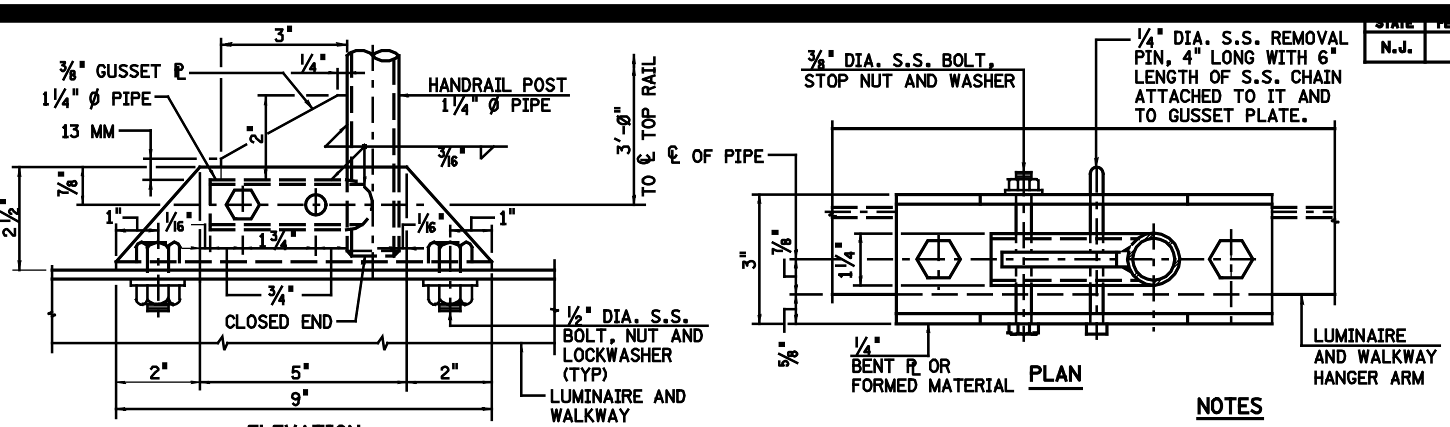
TYPICAL MAINTENANCE WALKWAY DETAIL



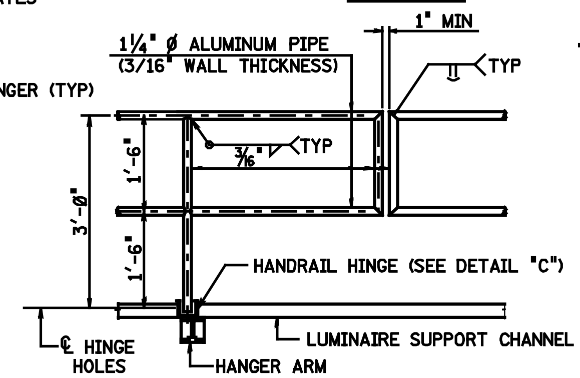
LUMINAIRE SUPPORT CHANNEL



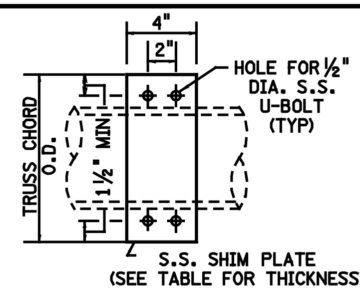
SECTION A-A



HANDRAIL HINGE DETAIL "C"



ELEVATION OF HANDRAIL

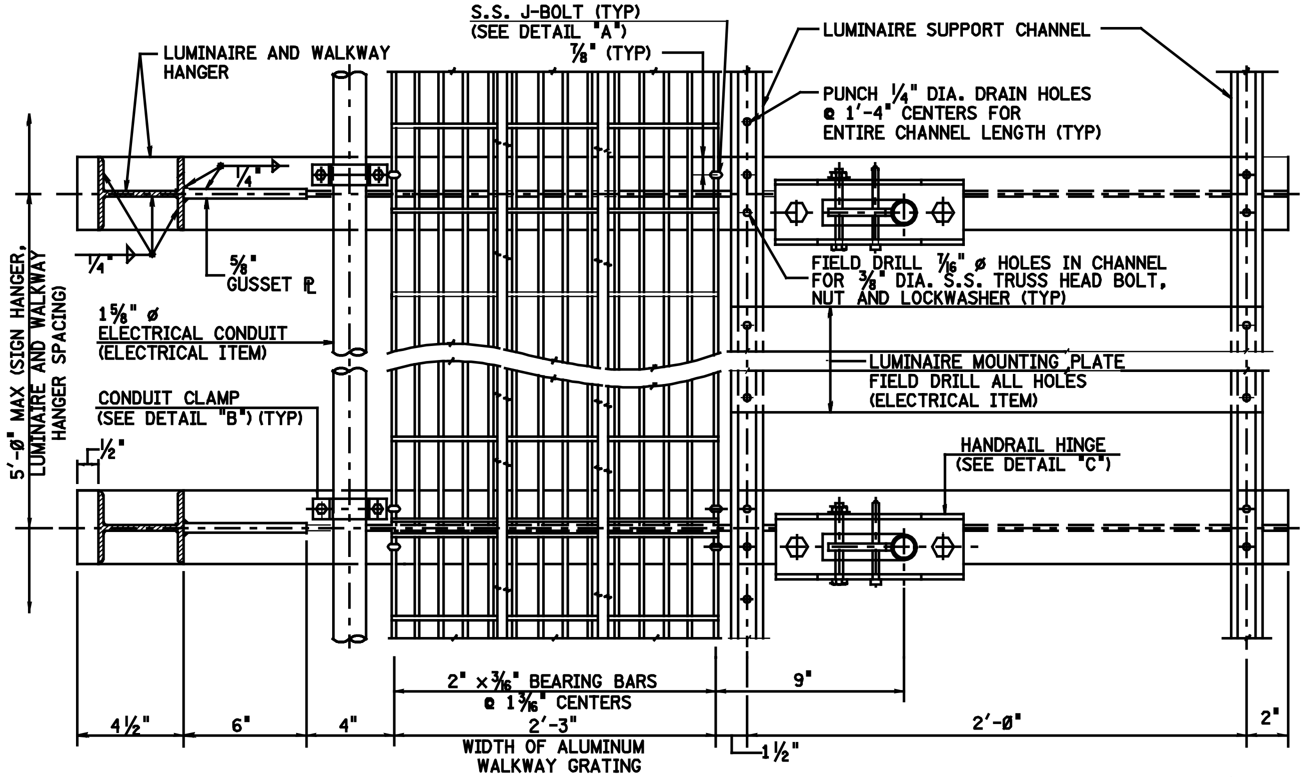


TRUSS CHORD O.D. (IN)	SHIM PACK THICKNESS* (MIN) (IN)
1Ø.75	¾
12.75	¾
14.Ø	¾

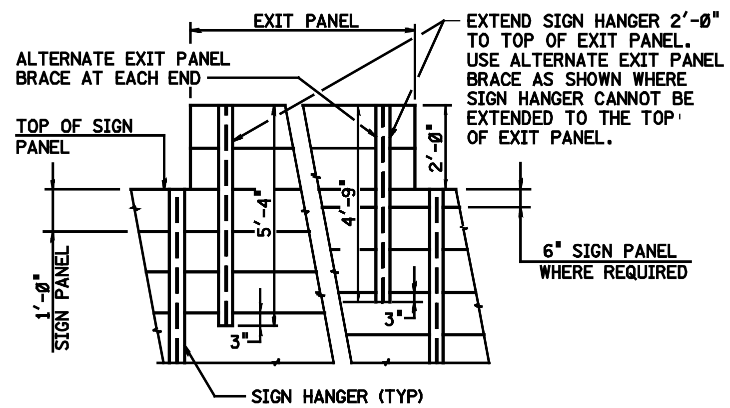
* FOR TRUSS CHORD SIZES NOT SHOWN, USE ¼" MIN. SHIM PLATE THICKNESS (SEE NOTE 5)

NOTES

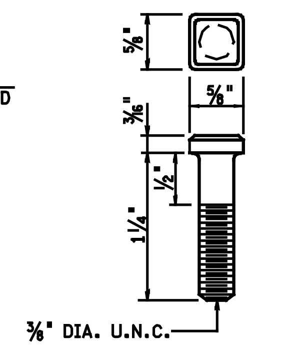
1. ALL MATERIAL SHALL BE ALUMINUM ALLOY 6Ø61-T6 UNLESS OTHERWISE NOTED.
2. ALL SHIM PLATES, BOLTS, U-BOLTS, WASHERS AND NUTS SHALL BE STAINLESS STEEL CONFORMING TO ASTM SPECIFICATION A32Ø GRADE B8, CLASS 1.
3. WELDING OF ALUMINUM SHALL BE AS SPECIFIED IN THE CONSTRUCTION SPECIFICATIONS.
4. ALUMINUM I-BEAM (DEPTH = 4", WEB AND FLANGE THICKNESS = ¼", FLANGE WIDTH = 3½"). SIGN HANGER SPACING DESIGNED FOR 15'-Ø" MAXIMUM SIGN PANEL HEIGHT.
5. THE THICKNESSES OF THE SHIM PLATES MAY BE MODIFIED TO AVOID INTERFERENCE BETWEEN THE CHORD SPLICE PLATES AND THE SIGN PANELS.
6. MAINTENANCE WALKWAY, RAILING AND LUMINAIRE SUPPORTS SHALL BE PROVIDED CONTINUOUSLY FOR THE ENTIRE SIGN DESIGN LENGTH UNLESS OTHERWISE SHOWN.
7. MINIMUM SECTION MODULUS OF ALUMINUM WALKWAY GRATING SHALL BE 1.35 CU. IN. PER FOOT WIDTH. WALKWAY GRATING SHALL NOT CANTILEVER MORE THAN 1'-Ø" BEYOND HANGER ARMS AT EACH END OF THE MAIN WALKWAY. WALKWAY GRATING SHALL BE CONTINUOUS OVER A MINIMUM OF TWO SPANS.
8. ALTERNATE PIPE FITTINGS FOR HANDRAIL MAY BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
9. ALL PIPES FOR HANDRAIL SHALL BE 1¼" NOMINAL DIA. WITH 3⁄16" WALL THICKNESS.
1Ø. MAXIMUM LENGTH OF HANDRAIL SECTION SHALL BE 1Ø'-Ø" AND SHALL INCLUDE TWO POSTS.
11. ALTERNATE HANDRAIL HINGE DETAILS MAY BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
12. LUMINAIRE AND WALKWAY HANGERS SHALL PROJECT 3" ABOVE THE TOP OF THE TOP CHORD AND SHALL NOT SUPPORT SIGN PANELS.
13. LENGTH OF SIGN HANGERS SHALL BE EQUAL TO THE SIGN PANEL HEIGHT.
14. SIGN HANGERS SHALL BE USED TO SUPPORT SIGN PANELS ONLY.
15. EXIT PANEL CONNECTION DETAIL SHOWN SHALL ALSO BE USED FOR THE ATTACHMENT OF NEW EXIT PANELS TO EXISTING SIGN PANELS.
16. SIGN PANELS SHALL NOT EXTEND MORE THAN 3'-Ø" BEYOND THE LAST SIGN HANGER. MAINTENANCE WALKWAYS SHALL NOT EXTEND MORE THAN 1'-Ø" BEYOND THE LAST WALKWAY HANGER.



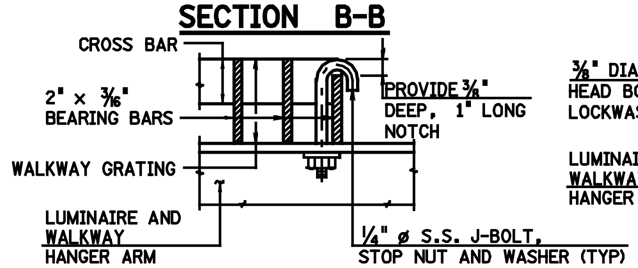
SECTION B-B



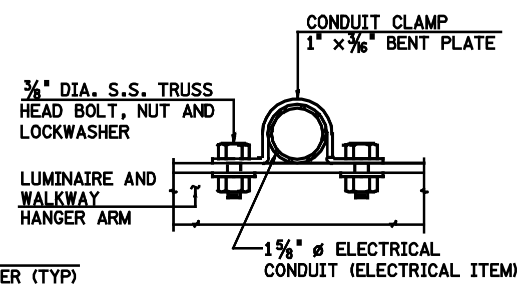
EXIT PANEL CONNECTION DETAIL



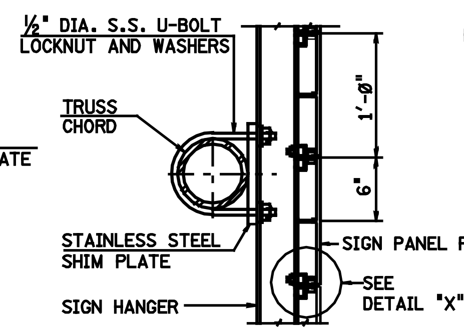
POST CLIP BOLT



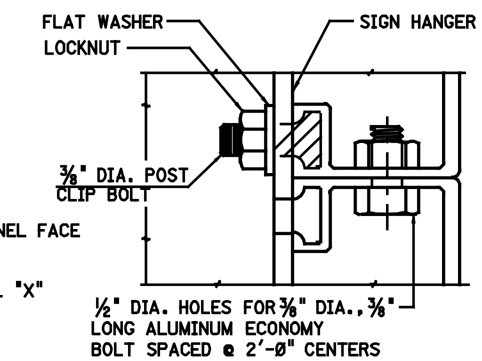
DETAIL "A"



DETAIL "B"



SIGN PANEL CONNECTION DETAIL



DETAIL "X"

STATE	FEDERAL PROJECT NO.
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SIGN STRUCTURE DRG. OH-D9

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

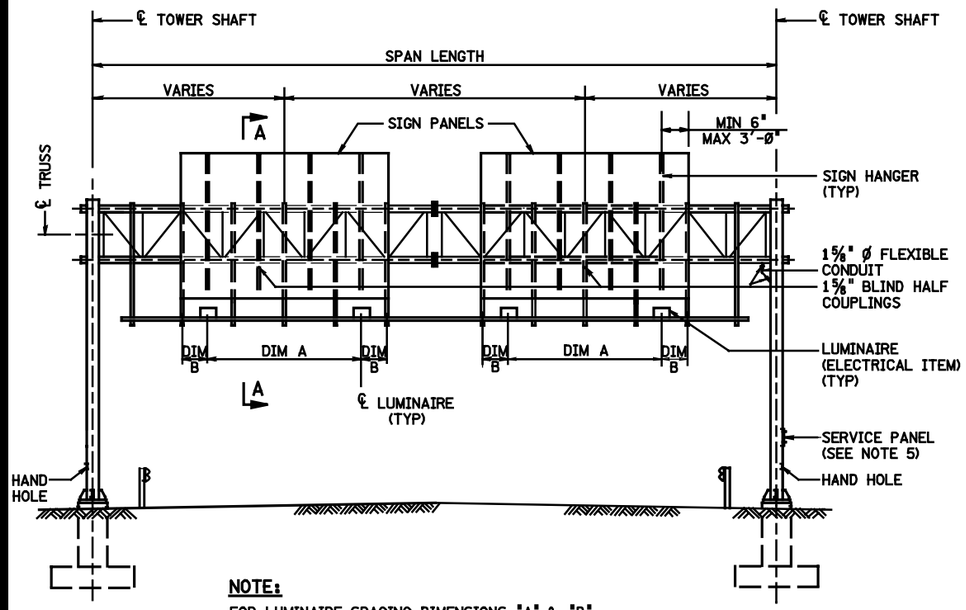
OVERHEAD SIGN SUPPORT STRUCTURES
MAINTENANCE WALKWAY DETAILS

ROUTE: SECTION:

SCALE : NONE

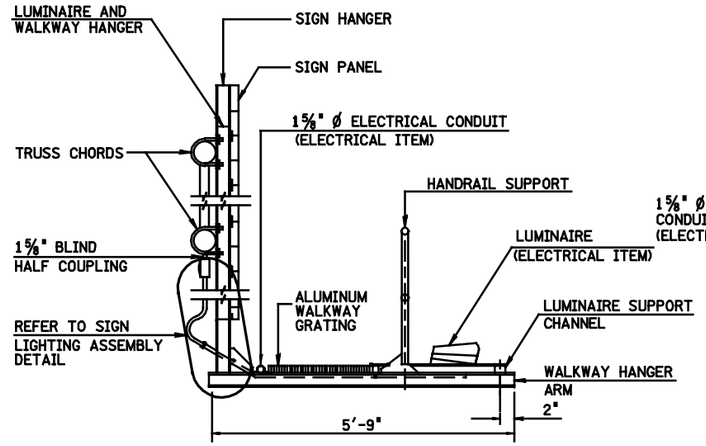
BRIDGE SHEET NO. OF

BDC02D-03 ORIGINAL SHEET

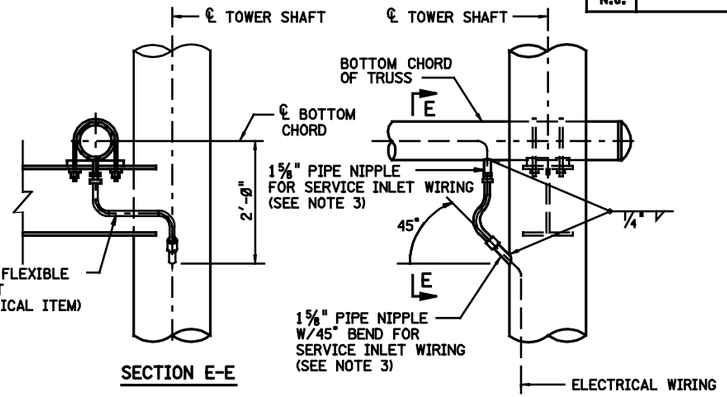


NOTE:
FOR LUMINAIRE SPACING DIMENSIONS "A" & "B" SEE SIGN LIGHTING ASSEMBLY DETAIL.

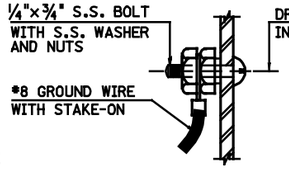
ELEVATION - TYPICAL OVERHEAD SIGN SUPPORT



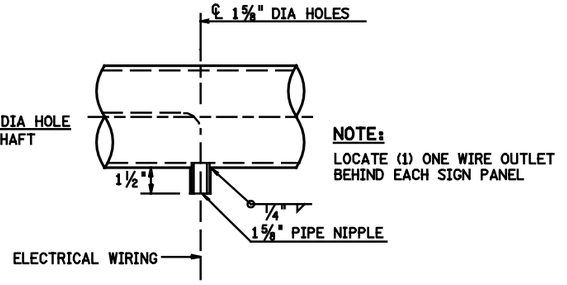
SECTION A-A



DETAILS OF WIRE OUTLETS

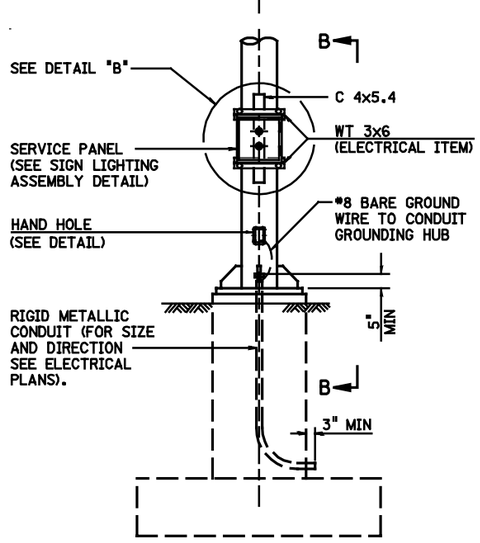


GROUND STUD

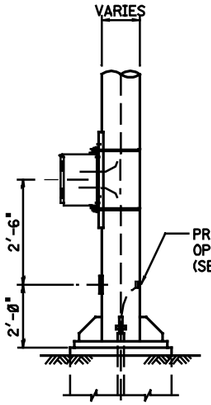


NOTE:
LOCATE (1) ONE WIRE OUTLET BEHIND EACH SIGN PANEL

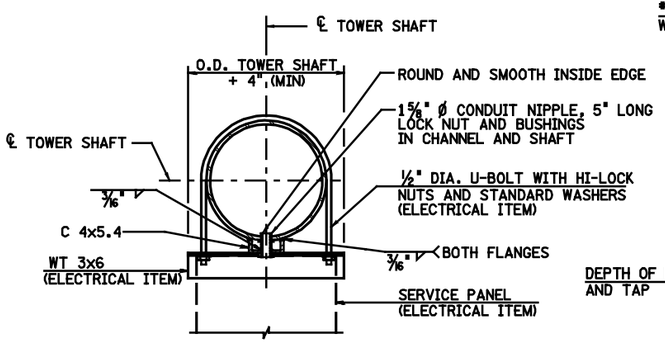
DETAIL OF WIRE OUTLET ON TUBE



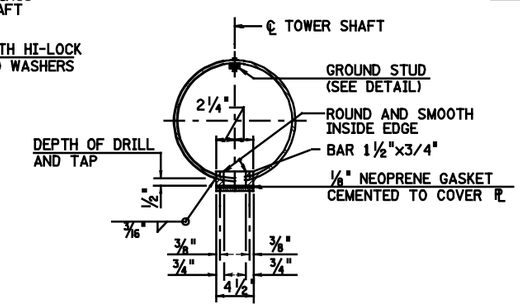
SIDE ELEVATION



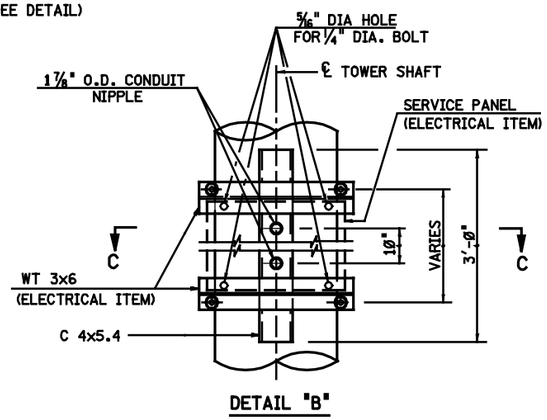
SECTION B-B



SECTION C-C



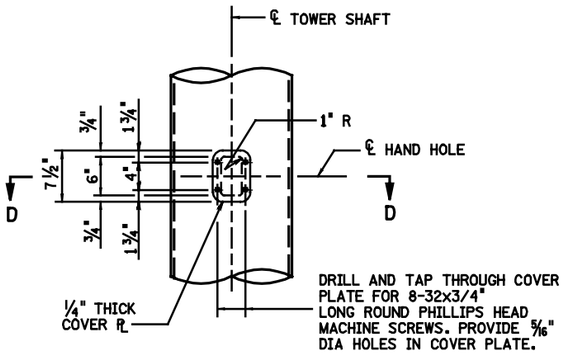
SECTION D-D



DETAIL "B"

NOTE:
HAND HOLE AND GROUND STUD TO BE PROVIDED IN EACH TOWER SHAFT

TYPICAL SERVICE PANEL DETAIL AT SIGN STRUCTURE



HAND HOLE AND COVER DETAIL

NOTES:

1. WHEN SIGN LIGHTING IS REQUIRED, AN APPROVED SIGN LIGHTING SYSTEM SHALL BE PROVIDED.
2. ALL BOLTS TO BE INSTALLED WITH WASHERS, LOCKWASHERS AND NUTS. ALL HARDWARE SHALL BE STAINLESS STEEL CONFORMING TO ASTM A320, GRADE B8, CLASS 1.
3. 1⅝" STANDARD PIPE NIPPLES SHALL BE OF APPROVED MATERIAL AND BE COMPATIBLE WITH THE MATERIAL TO WHICH THEY ARE WELDED.
4. IF REQUIRED, WALKWAY GRATING AND LUMINAIRE SUPPORT CHANNELS SHALL BE CONTINUOUS FROM HANGER TO HANGER.
5. SEE ELECTRICAL PLANS FOR LOCATION AND DIRECTION OF SERVICE PANEL, RIGID CONDUITS, AND FLEXIBLE CONDUITS.

STATE N.J. | FEDERAL PROJECT NO.

SIGN STRUCTURE DRG. OH-D1Ø

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

OVERHEAD SIGN SUPPORT STRUCTURES TYPICAL ELECTRICAL DETAILS

ROUTE: SECTION:

SCALE : NONE

BRIDGE
SHEET NO. OF

8/20/03 ORIGINAL SHEET

GENERAL NOTES

A. DESIGN CRITERIA

DESIGN SPECIFICATIONS

1996 AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES (16TH EDITION) AS MODIFIED BY SECTION 3 AND SECTION 32 OF THE CURRENT NJDOT DESIGN MANUAL - BRIDGES AND STRUCTURES, AND 1994 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS.

DESIGN LOADS

DESIGN WIND VELOCITY ---- 8Ø MPH
DESIGN ICE LOAD ----------- 3 PSF

SEISMIC LOADS FOR SEISMIC PERFORMANCE CATEGORY (SPC) B, A=Ø.18, SOIL PROFILE IV (REF. 1996 AASHTO, DIVISION 1A).

FATIGUE LOADS

ALL STRUCTURAL DETAILS HAVE BEEN DESIGNED FOR FATIGUE RESISTANCE UNDER THE FOLLOWING FATIGUE LOADS:

1) NATURAL WIND GUSTS: Pnw = 5.2Cd (PSF),
WHERE Cd IS THE DRAG COEFFICIENT SPECIFIED IN SECTION 1.2.5 OF THE 1994 STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS. NATURAL WIND GUST PRESSURE RANGE APPLIED IN THE HORIZONTAL DIRECTION TO THE AREA PROJECTED ON A VERTICAL PLANE OF ALL SUPPORT STRUCTURE MEMBERS, SIGN PANELS AND WALKWAYS.

2) TRUCK-INDUCED GUSTS: Ptg = 36.6Cd (PSF),
WHERE Cd IS THE DRAG COEFFICIENT SPECIFIED IN SECTION 1.2.5 OF THE 1994 STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS. TRUCK GUST PRESSURE RANGE APPLIED IN THE UPWARD VERTICAL DIRECTION ALONG THE FULL LENGTH OF THE TRUSS SPAN TO THE AREA PROJECTED ON A HORIZONTAL PLANE OF ALL SUPPORT STRUCTURE MEMBERS, SIGN PANELS, AND WALKWAYS.

VARIABLE MESSAGE SIGN (VMS) STRUCTURES

REFER TO SECTION 32 OF THE NJDOT DESIGN MANUAL - BRIDGES AND STRUCTURES WHEN FURNISHING SUPPORT STRUCTURES FOR VARIABLE MESSAGE SIGNS (VMS).

CONCRETE DESIGN STRESSES

SPECIFIED COMPRESSIVE STRENGTH (f'c) (CLASS B) ---- 3,ØØØ PSI
EXTREME FIBER COMPRESSIVE STRESS (fc) ------------ 1,2ØØ PSI

REINFORCEMENT STEEL DESIGN STRESS

TENSILE STRESS (fs) (A615, GRADE 6Ø) ---- 24 KSI

STRUCTURAL STEEL DESIGN STRENGTHS

YIELD STRENGTH (Fy)
PIPES (A53, TYPE S OR TYPE E, GRADE B) ---- 35 KSI (MIN.)
---- 51 KSI (MAX.)

FOUNDATIONS

MAXIMUM FOUNDATION BEARING PRESSURE ---- 2.5 KSF
FOOTINGS ARE DESIGNED SUCH THAT A MINIMUM OF 75 PERCENT OF THE FOOTING IS ALWAYS IN CONTACT; A MAXIMUM OF 25 PERCENT OF THE FOOTING IS IN UPLIFT.

BEARING PILES SHALL BE CAST-IN-PLACE CONCRETE PILES WITH A MINIMUM BEARING CAPACITY EQUAL TO 5Ø KIPS.

CAMBER

PERMANENT CAMBER EQUAL TO L/1ØØØ HAS BEEN PROVIDED IN ADDITION TO THE DEAD LOAD CAMBER.

B. MATERIALS

I. STEEL

STEEL PIPE SHALL BE CERTIFIED BY MILL TEST REPORT TO MEET ASTM SPECIFICATION A53, TYPE E OR S, GRADE B WITH THE EXCEPTION THAT API 5L, GRADE B MAY BE USED WHEN THE SPECIFIED WALL THICKNESS IS GREATER THAN ½". ONLY ELECTRICAL RESISTANCE WELDED (ERW) MANUFACTURED SINGLE SEAM PIPE IS PERMITTED. HOWEVER, WHEN THE REQUIRED PIPE SIZE IS GREATER THAN 24", DOUBLE SEAM PIPE MAY BE USED. A MILL TEST REPORT MUST BE PROVIDED, CERTIFIED AND SIGNED BY THE PIPE MANUFACTURER, CONTAINING PHYSICAL AND CHEMICAL PROPERTIES AND THE MANUFACTURING PROCESS USED TO PRODUCE THE PIPE.

ALL OTHER STEEL SHALL CONFORM TO ASTM SPECIFICATION A36 GRADE 36 OR AASHTO M27Ø GRADE 5Ø (ASTM A7Ø9). ALL THIS SPECIFICATION STEEL SHALL MEET SUPPLEMENTARY REQUIREMENTS FOR NOTCH TOUGHNESS (CHARPY TESTING, ZONE #2)

REFER TO SUBSECTION 5Ø9.Ø2 OF THE NJDOT STANDARD SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

UPON COMPLETION OF FABRICATION, THE FABRICATOR SHALL PROVIDE A NOTARIZED CERTIFICATION OF COMPLIANCE AS PER SECTION 1Ø6.Ø4 OF THE NJDOT STANDARD SPECIFICATIONS, INCLUDING A LEGIBLE COPY OF ALL MILL TEST REPORTS FOR MATERIALS INCORPORATED INTO THE WORK.

STEEL ANCHOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM SPECIFICATION F1554, GRADE 36. THE ANCHOR BOLTS SHALL BE HOT DIP GALVANIZED AS PER ASTM SPECIFICATION A153, CLASS C.

CHORD SPLICE ASSEMBLY FASTENERS SHALL BE HIGH STRENGTH STEEL CONFORMING TO ASTM SPECIFICATION A325 AND SHALL BE HOT DIP GALVANIZED AS PER ASTM SPECIFICATION A153, CLASS C. ALL OTHER FASTENERS SHALL BE STAINLESS STEEL CONFORMING TO ASTM SPECIFICATION A32Ø, GRADE B8, CLASS 1.

CAPS FOR THE ENDS OF CHORDS AND TOPS OF POSTS SHALL BE STEEL CONFORMING TO ASTM SPECIFICATION A36 AND SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM SPECIFICATION A123.

WELDING OF STEEL SHALL BE AS SPECIFIED IN THE CONSTRUCTION SPECIFICATIONS.

AFTER COMPLETE FABRICATION, EACH STEEL SECTION SHALL BE HOT DIP GALVANIZED ACCORDING TO THE REQUIREMENTS OF ASTM SPECIFICATION A123, AS MODIFIED BY THE CONSTRUCTION SPECIFICATIONS. A SINGLE DIP GALVANIZING PROCESS IS PREFERRED IF SIZE PERMITS.

II. ALUMINUM

ALUMINUM SHALL CONFORM TO THE ASTM SPECIFICATIONS AND ALLOYS LISTED BELOW:

APPLICATION	ASTM SPECIFICATION	ASTM ALLOY
ROLLED OR EXTRUDED SHAPES	B3Ø8	6Ø61 - T6
PLATES	B2Ø9	6Ø61 - T6
DRAWN SEAMLESS TUBES	B21Ø	6Ø61 - T6
EXTRUDED TUBES	B221	6Ø61 - T6

WELDING OF ALUMINUM SHALL BE AS SPECIFIED IN THE CONSTRUCTION SPECIFICATIONS.

III. REINFORCEMENT STEEL

ALL REINFORCEMENT STEEL SHALL BE ASTM A615, GRADE 6Ø.

IV. CONCRETE

ALL CONCRETE SHALL BE "CONCRETE IN STRUCTURES, FOOTINGS", UNLESS OTHERWISE SPECIFIED BY THE DESIGNER.

V. SIGN LIGHTING

WHEN NECESSARY, AN APPROVED SIGN LIGHTING SYSTEM MAY BE USED AND THE DETAILS OF THE SYSTEM SHALL BE PROVIDED. NJDOT TRAFFIC SIGNAL AND SAFETY ENGINEERING SHOULD BE CONTACTED FOR REQUIREMENTS REGARDING THE PROVISION OF SIGN LIGHTING OR REFLECTORIZED SIGN PANELS.

VI MAINTENANCE WALKWAY

THE PROVISION OF MAINTENANCE WALKWAYS IS NOT REQUIRED. THE MAINTENANCE WALKWAY DETAIL SHEET SHALL BE EXCLUDED FROM SIGN STRUCTURE DRAWINGS WHEN WALKWAY IS NOT PROVIDED. IF THE WALKWAY IS PROVIDED, ADD THE FOLLOWING TO THE GENERAL NOTES OF THE SIGN STRUCTURE DRG. CA-D1. "MAINTENANCE WALKWAYS AND LUMINAIRE SUPPORTS SHALL BE ALUMINUM. SIGN HANGERS SHALL BE ALUMINUM OR STEEL. STEEL SURFACES SHALL BE PREVENTED FROM COMING INTO CONTACT WITH ALUMINUM SURFACES BY MEANS OF APPROVED PADS OR A PROTECTIVE COATING PLACED BETWEEN THE DISSIMILAR METALS. PADS SHALL BE STAINLESS STEEL CONFORMING TO ASTM SPECIFICATION A24Ø, TYPE 3Ø4 OR APPROVED EQUAL."

INSTRUCTIONS FOR DESIGNERS

STEP #1: PREPARE A SIGN SUPPORT LOCATION PLAN AND ELEVATION VIEW FOR EACH STRUCTURE.

STEP #2: ENTER THE SIGN SUPPORT NUMBER AND STATION IN THE SCHEDULE OF STRUCTURES ON SIGN STRUCTURE DRG. CA-D2 OF THE CONTRACT PLANS.

STEP #3: DETERMINE THE TRUSS SPAN LENGTH AND HEIGHT OF THE STRUCTURE USING SIGN STRUCTURE DRG. CA-G2. RECORD THE ACTUAL TRUSS SPAN LENGTH IN THE SCHEDULE OF STRUCTURES ON SIGN STRUCTURE DRG. CA-D2 OF THE CONTRACT PLANS. ROUND THIS NUMBER TO THE NEXT HIGHER LISTED SPAN LENGTH. IF THE TRUSS SPAN LENGTH IS OVER 4Ø'-Ø", PROCEED TO STEP #16.

STEP #4: DETERMINE THE SIGN DESIGN LENGTH USING SIGN STRUCTURE DRG. CA-G2. DIVIDE THE SIGN DESIGN LENGTH BY THE TRUSS SPAN LENGTH DETERMINED IN STEP #3 TO OBTAIN THE PERCENT SIGN DESIGN LENGTH. USE THE NEXT HIGHER PERCENT FROM THOSE LISTED (4Ø%, 6Ø%, 7Ø%, OR 8Ø%). IF THE PERCENT IS MORE THAN 8Ø, PROCEED TO STEP #5. OTHERWISE, SKIP TO STEP #6.

STEP #5: TO SELECT A STANDARD DESIGN, DIVIDE THE SIGN DESIGN LENGTH BY 8Ø% AND ROUND THIS NUMBER TO THE NEXT HIGHER LISTED SPAN LENGTH. IF THE NUMBER IS LESS THAN 4Ø'-Ø", RETURN TO STEP #4. OTHERWISE, PROCEED TO STEP #16.

STEP #6: HAVING OBTAINED THE TRUSS SPAN LENGTH (FROM STEP #3 OR STEP #5) AND THE PERCENT SIGN DESIGN LENGTH (FROM STEP #4), SELECT THE TRUSS SIZE AND THE TRUSS ELEMENT SIZES (I.E., CHORDS, DIAGONALS, AND STRUTS) USING THE APPROPRIATE DESIGN TABLES ON SIGN STRUCTURE DRG. CA-G3. RECORD THE DATA IN THE SCHEDULE OF STRUCTURES ON SIGN STRUCTURE DRG. CA-D2 OF THE CONTRACT PLANS.

STEP #7: WITH THE HEIGHT OF THE STRUCTURE OBTAINED IN STEP #3 AND USING THE ELEVATION OF THE BOTTOM OF BASE PLATE, DETERMINE THE ELEVATION OF THE CENTER LINE OF THE TRUSS AND THE DESIGN HEIGHT OF THE POST. IF THE POST HEIGHT IS MORE THAN 4Ø'-Ø", SKIP TO STEP #16. OTHERWISE, SELECT THE NEXT HIGHER NUMBER FROM THOSE LISTED (25, 3Ø, OR 4Ø FEET). USING THE SAME TABLE USED IN STEP #6, SELECT THE SIZE OF THE POST (I.E., OUTSIDE DIAMETER AND THICKNESS). RECORD THE DATA IN THE SCHEDULE OF STRUCTURES ON SIGN STRUCTURE DRG. CA-D2 OF THE CONTRACT DRAWINGS.

STEP #8: CHECK AVAILABILITY OF SHAPES SELECTED IN STEPS #6 AND #7.

STEP #9: USING SOIL TEST AND SOIL BORING INFORMATION, DETERMINE THE ALLOWABLE SOIL PRESSURE AND THE REQUIRED DEPTH OF FOOTINGS.

STEP #1Ø: DETERMINE THE PEDESTAL HEIGHT. IF THE PEDESTAL HEIGHT IS BETWEEN 4'-Ø" AND 6'-Ø", PROCEED TO STEP #11. OTHERWISE, SKIP TO STEP #16. THE PREFERRED PEDESTAL HEIGHT OF 4'-6" IS TO BE USED WHENEVER POSSIBLE. WHEN USING A BARRIER PEDESTAL, THE "COVERED" HEIGHT MUST BE 3'-Ø". OTHERWISE, SKIP TO STEP # 16

STEP #11: DETERMINE THE REQUIRED FOOTING SIZES USING THE DESIGN TABLE ON SIGN STRUCTURE DRGS. CA-G3. RECORD THE DATA IN THE SIGN SUPPORT FOUNDATION TABLE ON SIGN STRUCTURE DRG. CA-D2 OF THE CONTRACT PLANS.

STEP #12: DETERMINE THE REQUIRED FOOTING DESIGN DATA USING SIGN STRUCTURE DRG. CA-G5. RECORD THIS DATA IN THE SIGN SUPPORT FOUNDATION TABLE ON SIGN STRUCTURE DRG. CA-D2 OF THE CONTRACT PLANS. IF THE ALLOWABLE SOIL PRESSURE IS GREATER THAN 2.5 KSF, SKIP TO STEP #14. OTHERWISE, PROCEED TO STEP #13.

STEP #13: SELECT THE NUMBER OF CAST-IN-PLACE CONCRETE PILES NEEDED TO SUPPORT THE STRUCTURE USING SIGN STRUCTURE DRG. CA-G5. RECORD THE DATA IN THE SIGN SUPPORT FOUNDATION TABLE ON SIGN STRUCTURE DRG. CA-D2 OF THE CONTRACT PLANS.

STEP #14: DETERMINE WHETHER A PEDESTAL OR BARRIER PEDESTAL IS TO BE USED FOR THE FOUNDATION. SELECT ALL PEDESTAL OR BARRIER PEDESTAL DATA FROM SIGN STRUCTURE DRG. CA-G4. RECORD THE DATA IN THE SIGN SUPPORT FOUNDATION TABLE ON SIGN STRUCTURE DRG. CA-D2 OF THE CONTRACT PLANS.

STEP #15: THE DESIGN OF THE CANTILEVER SIGN SUPPORT STRUCTURE IS COMPLETE. DISREGARD STEP #16

STEP #16: THE PARAMETERS OF THE SIGN SUPPORT STRUCTURE EXCEED THE RESTRICTIONS RELATED TO THESE STANDARD DESIGN TABLES. DESIGN THE SIGN SUPPORT STRUCTURE ON AN INDIVIDUAL BASIS.

INDEX OF DRAWINGS

DRG. NO.	DESCRIPTION
CA-G1	GENERAL INFORMATION
CA-G2	GENERAL CRITERIA
CA-G3	DESIGN TABLES - STEEL TRUSSES AND STEEL POSTS
CA-G4	PEDESTAL AND BARRIER PEDESTAL DESIGN TABLES AND DETAILS
CA-G5	FOOTING DESIGN TABLES AND DETAILS

THIS PLATE FOR DESIGN INFORMATION ONLY.
DO NOT INCLUDE IN CONTRACT PLANS.

SIGN STRUCTURE DRG. CA-G1

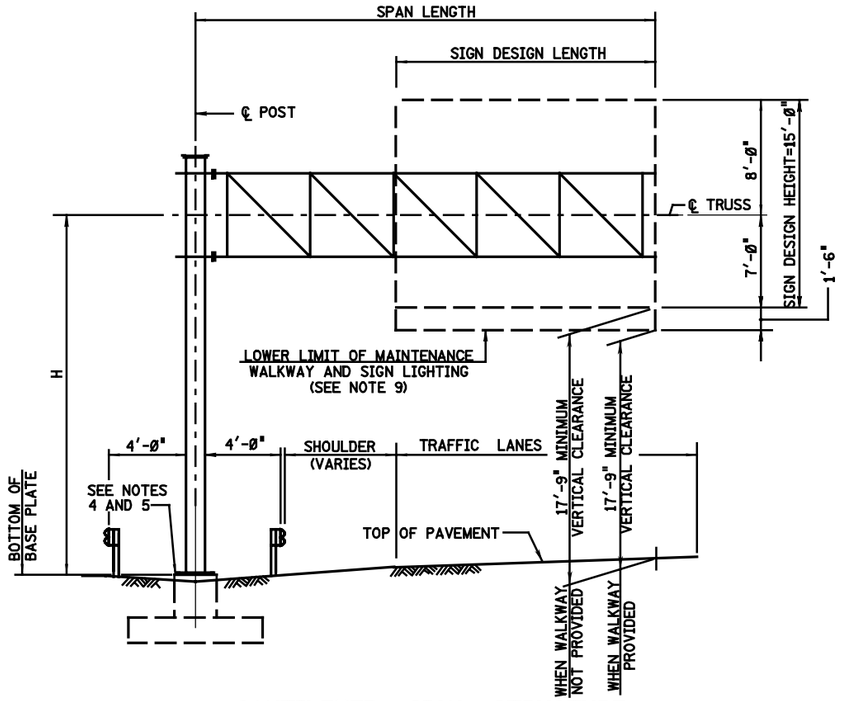
NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

CANTILEVER SIGN SUPPORT STANDARDS

GENERAL INFORMATION

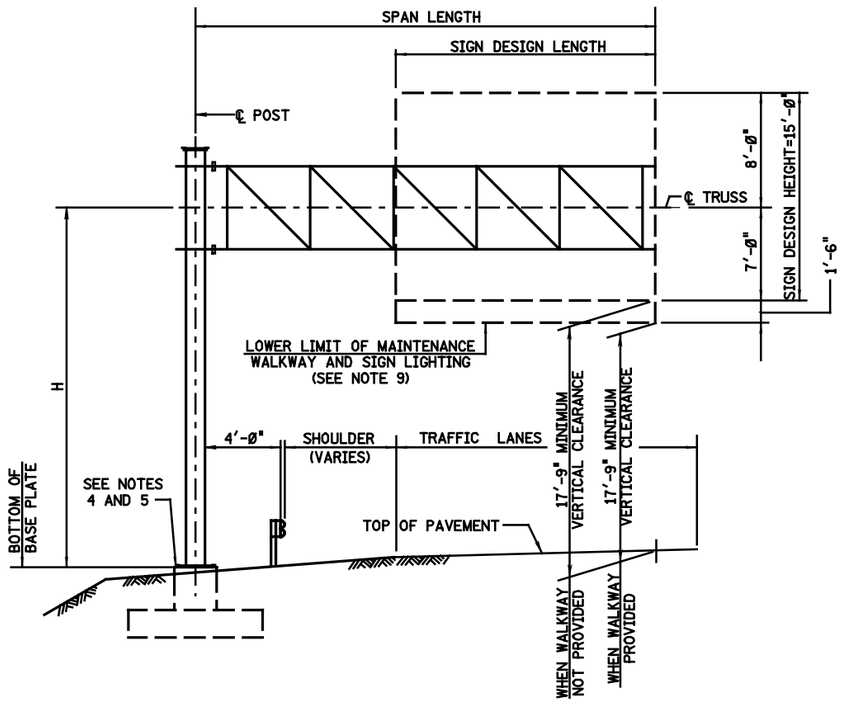
SCALE : NONE

BDC02D-03 - ORIGINAL SHEET



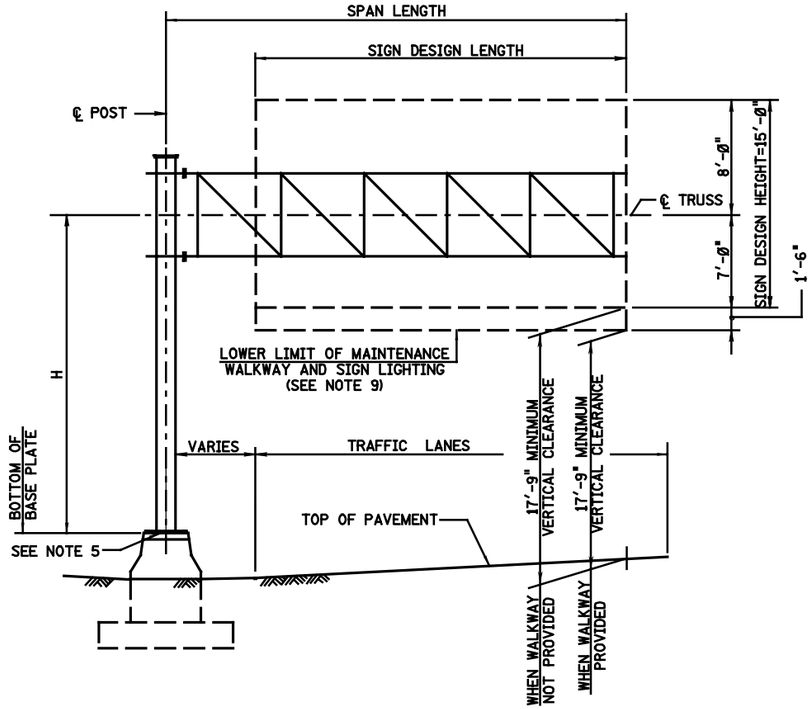
CANTILEVER SIGN STRUCTURE

DIVIDED HIGHWAY
PEDESTAL MOUNTED



CANTILEVER SIGN STRUCTURE

NONDIVIDED HIGHWAY AND RAMPS
PEDESTAL MOUNTED



CANTILEVER SIGN STRUCTURE

DIVIDED HIGHWAY
BARRIER MOUNTED

NOTES:

1. THE SIGN DESIGN LENGTH EXTENDS FROM THE END OF THE CANTILEVER TO THE EDGE OF THE USEABLE TRAFFIC LANES.
2. THE BOTTOM EDGE OF ALL SIGN PANELS SHALL BE LEVEL AND AT THE SAME ELEVATION.
3. THE TOP EDGE OF ALL SIGN PANELS SHALL PROJECT NOT LESS THAN 6" ABOVE THE TOP OF THE TOP CHORD. THE SIGN PANEL SIZES AND LOCATIONS SHALL BE VERIFIED AND APPROVED BY THE DESIGNER.
4. TOP OF PEDESTALS SHALL BE SET 4" ABOVE THE FINISHED GROUND LINE.
5. THE ELEVATION OF THE BOTTOM OF THE POST BASE PLATE SHALL BE SET AT (ANCHOR BOLT DIAMETER + 1") ABOVE TOP OF PEDESTAL OR TOP OF BARRIER PEDESTAL.
6. THE TRUSS SHALL BE A TWO-CHORD PLANAR TRUSS.
7. IF REQUIRED, MAINTENANCE WALKWAY, RAILING, AND LUMINAIRE SUPPORTS SHALL BE PROVIDED CONTINUOUSLY FOR THE ENTIRE SIGN DESIGN LENGTH. THE NEED FOR MAINTENANCE WALKWAY, RAILING AND LUMINAIRE SUPPORTS SHALL BE VERIFIED AS PART OF THE PRELIMINARY SUBMISSION.
8. IF THE POST FOUNDATION IS WITHIN THE CLEAR ZONE, IT SHALL BE PROTECTED BY GUIDE RAIL, BARRIER OR OTHER SUITABLE MEANS, DEPENDING UPON SITE CONDITIONS.
9. WHEN MAINTENANCE WALKWAY IS NOT PROVIDED, THE 17'-9" VERTICAL UNDERCLEARANCE SHALL BE PROVIDED TO THE BOTTOM OF SIGN LIGHTING. THE WALKWAY RELATED DETAILS SHALL BE EXCLUDED FROM THE SIGN STRUCTURE PLANS.

THIS PLATE FOR DESIGN INFORMATION ONLY.
DO NOT INCLUDE IN CONTRACT PLANS.

SIGN STRUCTURE DRG. CA-G2

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

CANTILEVER SIGN SUPPORT STANDARDS

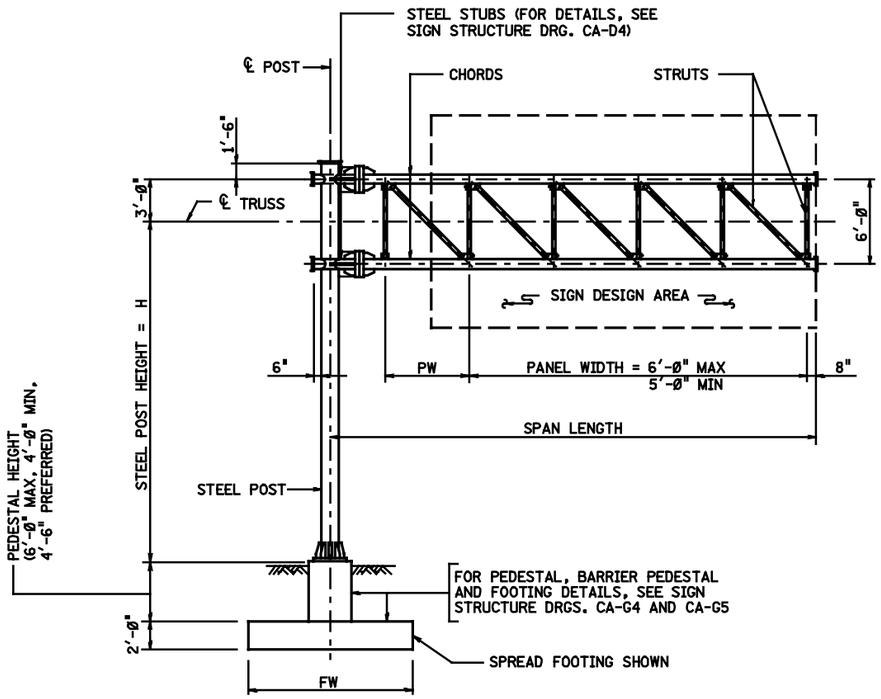
GENERAL CRITERIA

SCALE : NONE

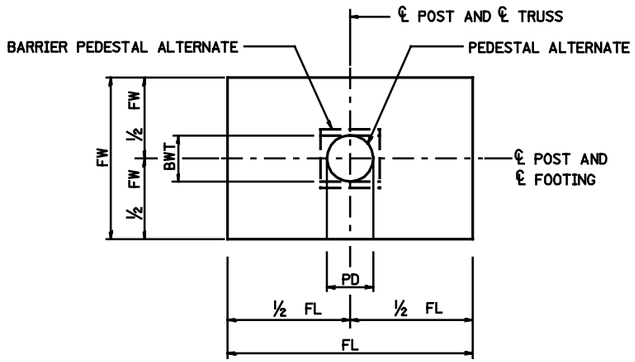
BRIDGE SHEET NO. 2 OF 5

SPAN LENGTH	SIGN LENGTH	STEEL TRUSS MEMBERS				STEEL POSTS			PEDESTALS						BARRIER PEDESTALS						FOOTINGS			SIGN LENGTH	SPAN LENGTH
						POST HEIGHT			H = 25 FT		H = 30 FT		H = 40 FT		H = 25 FT		H = 30 FT		H = 40 FT		H = 25 FT	H = 30 FT	H = 40 FT		
(FT)	(%)	CHORDS O.D.xTHICK (IN)	STRUTS O.D.xTHICK (IN)	STEEL STUBS O.D.xTHICK (IN)	CAMBER (IN)	H = 25 FT O.D.xTHICK (IN)	H = 30 FT O.D.xTHICK (IN)	H = 40 FT O.D.xTHICK (IN)	PD (IN)	VERT REBARS No. & SIZE	PD (IN)	VERT REBARS No. & SIZE	PD (IN)	VERT REBARS No. & SIZE	BWT (IN)	VERT REBARS No. & SIZE	BWT (IN)	VERT REBARS No. & SIZE	BWT (IN)	VERT REBARS No. & SIZE	FLxFW	FLxFW	FLxFW	(%)	(FT)
20	40	8.625x.322	2.875x.276	8.625x.322	3½	14.000x.500	16.000x.500	18.000x.500	40	21-#25	42	23-#25	44	25-#25	40	21-#25	42	23-#25	44	25-#25	11'-6"x8'	11'-6"x8'	12'-6"x8'	40	
	50	8.625x.500	2.875x.276	8.625x.500	3⅛	16.000x.500	16.000x.500	18.000x.500	42	23-#25	42	25-#25	44	27-#25	42	23-#25	42	25-#25	44	27-#25	11'-6"x8'	12'-6"x8'	13'x8'	50	
	60	8.625x.500	2.875x.276	8.625x.500	2¾	16.000x.500	18.000x.500	20.000x.500	42	24-#25	44	26-#25	46	29-#25	42	24-#25	44	26-#25	46	29-#25	12'-6"x8'	13'x8'	14'x10'	60	20
	70	8.625x.500	2.875x.276	8.625x.500	2⅜	18.000x.500	18.000x.500	20.000x.500	44	26-#25	44	27-#25	46	30-#25	44	26-#25	44	27-#25	46	30-#25	13'x8'	13'x9'	14'x10'	70	
	80	8.625x.500	2.875x.276	8.625x.500	2	18.000x.500	20.000x.500	22.000x.500	44	27-#25	46	30-#25	48	33-#25	44	27-#25	46	30-#25	48	33-#25	13'x9'	14'x10'	15'x10'	80	
30	40	12.750x.375	3.500x.300	12.750x.375	6	20.000x.500	20.000x.500	22.000x.500	46	28-#25	46	30-#25	48	33-#25	46	28-#25	46	30-#25	48	33-#25	13'x9'	14'x9'	14'x10'	40	
	50	12.750x.500	4.000x.318	12.750x.500	5½	20.000x.500	22.000x.500	24.000x.500	46	29-#25	48	33-#25	50	36-#25	46	29-#25	48	33-#25	50	36-#25	14'x9'	14'x10'	15'x10'-6"	50	
	60	12.750x.500	4.000x.318	12.750x.500	4¾	22.000x.500	24.000x.500	24.000x.500	48	31-#25	50	35-#25	50	37-#25	48	31-#25	50	35-#25	50	37-#25	14'x10'	15'x10'-6"	16'-6"x10'-6"	60	30
	70	12.750x.500	4.000x.318	12.750x.500	4⅜	22.000x.500	24.000x.500	26.000x.500	48	31-#25	50	36-#25	52	41-#25	48	31-#25	50	36-#25	52	41-#25	15'x10'	15'-6"x10'-6"	16'-6"x11'-6"	70	
	80	12.750x.500	4.000x.318	12.750x.500	3½	24.000x.500	26.000x.500	26.000x.625	50	34-#25	52	39-#25	52	42-#25	50	34-#25	52	39-#25	52	42-#25	15'x10'-6"	16'-6"x10'-6"	17'-6"x11'-6"	80	
40	40	18.000x.375	5.563x.375	18.000x.375	8	24.000x.500	26.000x.500	26.000x.625	50	30-#25	52	35-#25	52	37-#25	50	30-#25	52	35-#25	52	37-#25	15'x10'-6"	16'-6"x10'-6"	16'-6"x11'-6"	40	
	50	18.000x.500	5.563x.375	18.000x.500	9	26.000x.500	26.000x.625	26.000x.625	52	33-#25	52	35-#25	52	37-#25	52	33-#25	52	35-#25	52	37-#25	16'-6"x11'-6"	16'-6"x11'-6"	17'x12'-6"	50	
	60	18.000x.500	5.563x.375	18.000x.500	7½	26.000x.625	26.000x.625	26.000x.750	52	33-#25	52	35-#25	52	38-#25	52	33-#25	52	35-#25	52	38-#25	16'-6"x11'-6"	17'x12'-6"	18'x12'-6"	60	40
	70	18.000x.500	5.563x.375	18.000x.500	7½	26.000x.625	26.000x.750	26.000x.750	52	33-#25	52	35-#25	52	38-#25	52	33-#25	52	35-#25	52	38-#25	17'x11'-6"	17'x12'-6"	18'x13'	70	
	80	18.000x.500	5.563x.375	18.000x.500	6⅝	26.000x.625	26.000x.750	26.000x.875	52	33-#25	52	37-#25	52	40-#25	52	33-#25	52	37-#25	52	40-#25	17'x12'-6"	18'x12'-6"	19'x13'	80	

NOTE: % SIGN LENGTH = $\frac{\text{SIGN DESIGN LENGTH}}{\text{SPAN LENGTH}} \times 100$



ELEVATION



FOOTING PLAN

THIS PLATE FOR DESIGN INFORMATION ONLY. DO NOT INCLUDE IN CONTRACT PLANS.

SIGN STRUCTURE DRG. CA-G3

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

CANTILEVER SIGN SUPPORT STANDARDS DESIGN TABLES

STEEL TRUSSES AND STEEL POSTS

SCALE : NONE

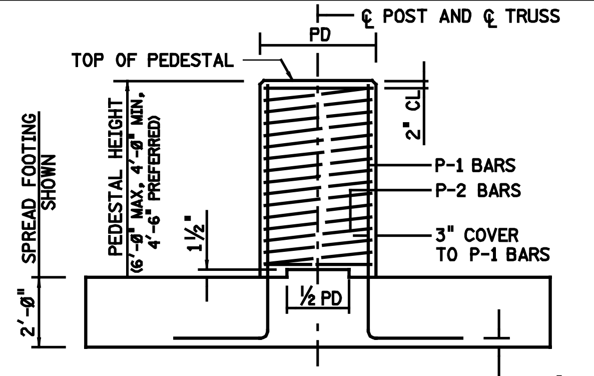
BRIDGE SHEET NO. OF

3
5

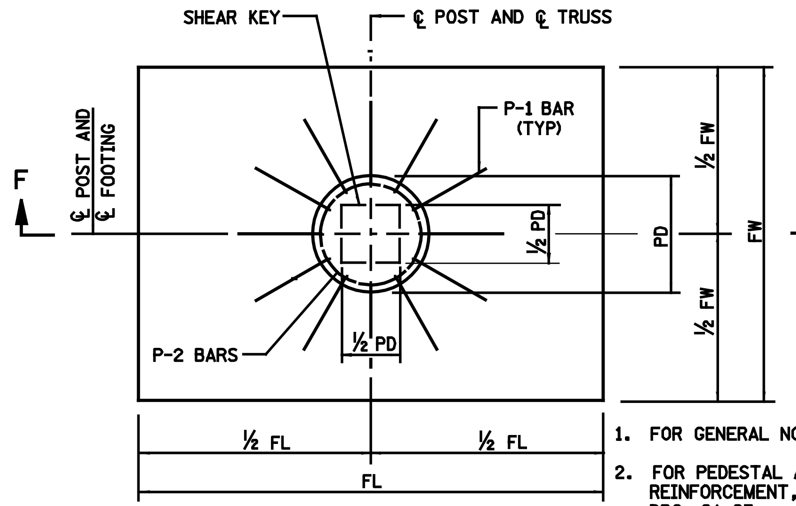
BD090.02 ORIGINAL SHEET

BARRIER PEDESTAL REINFORCEMENT

BARRIER TOP DIMENSION	VOL OF CONC	VERTICAL BARS				SPIRAL BARS				STANDARD BARRIER REBARS														WEIGHT SUB TOTAL
		TYPE "P-1"				TYPE "P-2"				#16 BAR, TYPE "B-1"				#16 BAR, TYPE "B-2"					#16 BAR, TYPE "B-3"					
BWT (IN)	(C.Y.)	SIZE	A	LENGTH	WEIGHT (LBS)	SIZE	SD (IN)	LENGTH	WEIGHT (LBS)	LENGTH	No.	TOTAL LENGTH	WEIGHT (LBS)	D (IN)	C (IN)	LENGTH	No.	WEIGHT (LBS)	E (IN)	F (IN)	LENGTH	No.	WEIGHT (LBS)	(LBS)
40	4.5	#25	2'-4"	9'- 9"	25.8	#13	36	259'-9"	173.5	8'-0"	10	80'-0"	83.4	34	12	4'-8"	4	19.5	54	32	9'-8"	12	121.0	223.9
42	4.8	#25	2'-4"	9'- 9"	25.8	#13	38	274'-2"	183.2	8'-0"	10	80'-0"	83.4	36	12	4'-10"	4	20.2	56	33	10'-0"	12	125.2	228.8
44	5.2	#25	2'-4"	9'- 9"	25.8	#13	40	288'-7"	192.8	8'-0"	10	80'-0"	83.4	38	12	5'-0"	4	20.9	58	34	10'-4"	12	129.3	233.6
46	5.5	#25	2'-4"	9'- 9"	25.8	#13	42	303'-0"	202.4	8'-0"	10	80'-0"	83.4	40	12	5'-2"	4	21.6	60	35	10'-8"	12	133.5	238.5
48	5.9	#25	2'-4"	9'- 9"	25.8	#13	44	317'-6"	212.1	8'-0"	12	96'-0"	100.1	42	12	5'-4"	5	27.8	62	36	11'-0"	12	137.7	265.6
50	6.3	#25	2'-4"	9'- 9"	25.8	#13	46	331'-11"	221.7	8'-0"	12	96'-0"	100.1	44	12	5'-6"	5	28.7	64	37	11'-4"	12	141.9	270.7
52	6.7	#25	2'-4"	9'- 9"	25.8	#16	48	346"-4"	361.2	8'-0"	12	96'-0"	100.1	46	12	5'-8"	5	29.6	66	38	11'-8"	12	146.0	275.7



SECTION F-F



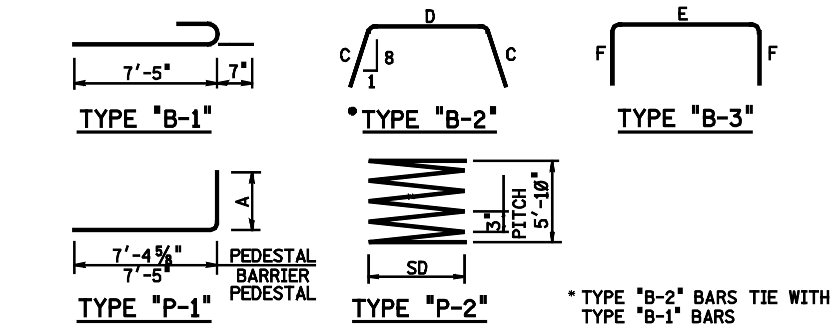
PLAN

PEDESTAL DETAILS

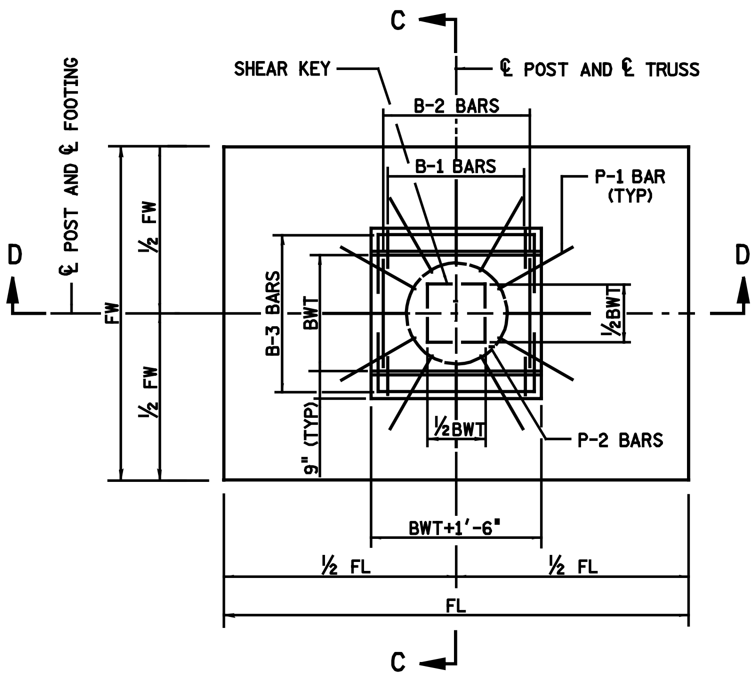
PEDESTAL REINFORCEMENT

PEDESTAL DIAMETER	VOL OF CONC	VERTICAL BARS				SPIRAL BARS			
		TYPE "P-1"				TYPE "P-2"			
PD (IN)	(C.Y.)	SIZE	A	LENGTH	WEIGHT (LBS)	SIZE	SD (IN)	LENGTH	WEIGHT (LBS)
40	1.8	#25	2'-4"	9'-7⅝"	25.7	#13	36	259'-9"	173.5
42	2.1	#25	2'-4"	9'-7⅝"	25.7	#13	38	274'-2"	183.2
44	2.2	#25	2'-4"	9'-7⅝"	25.7	#13	40	288'-7"	192.8
46	2.5	#25	2'-4"	9'-7⅝"	25.7	#13	42	303'-0"	202.4
48	2.6	#25	2'-4"	9'-7⅝"	25.7	#13	44	317'-6"	212.1
50	2.9	#25	2'-4"	9'-7⅝"	25.7	#13	46	331'-11"	221.7
52	3.1	#25	2'-4"	9'-7⅝"	25.7	#16	48	346"-4"	361.2

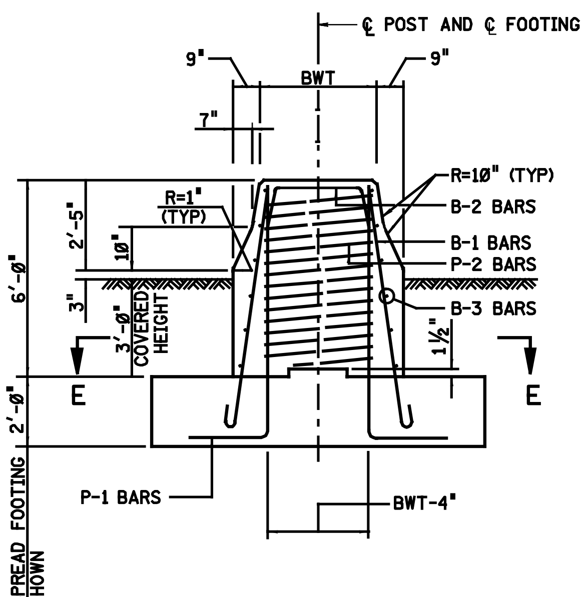
BAR SHAPES



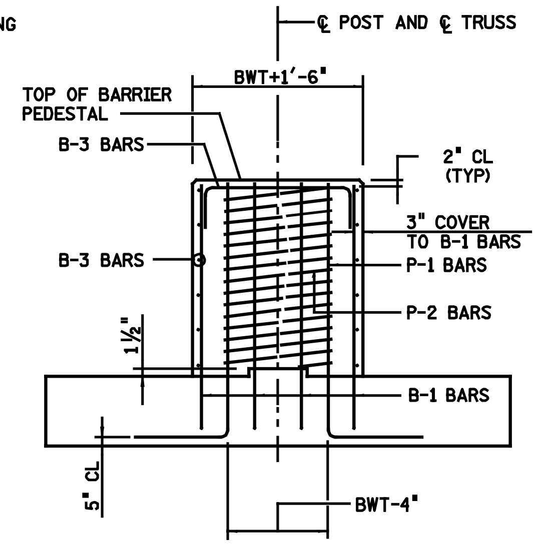
* TYPE "B-2" BARS TIE WITH TYPE "B-1" BARS



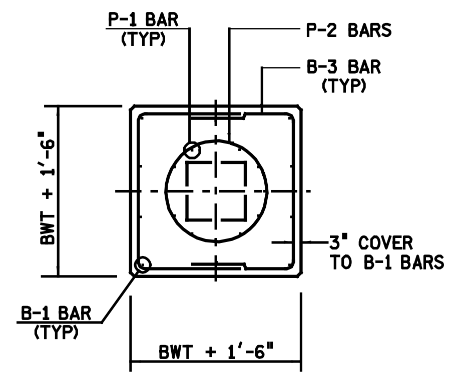
PLAN



SECTION C-C



SECTION D-D



SECTION E-E

BARRIER PEDESTAL DETAILS

NOTES:

1. FOR GENERAL NOTES, SEE SIGN STRUCTURE DRG. CA-G1.
2. FOR PEDESTAL AND BARRIER PEDESTAL DIMENSIONS AND REINFORCEMENT, SEE DESIGN TABLES ON SIGN STRUCTURE DRG. CA-G3.
3. ALL REINFORCEMENT IN PEDESTALS AND BARRIER PEDESTALS SHALL BE CORROSION PROTECTED.
4. EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 1"x1" UNLESS NOTED OTHERWISE.
5. BARS SHALL NOT BE SPLICED EXCEPT AS PROVIDED ON THIS DRAWING OR AUTHORIZED BY THE ENGINEER. WHEN SPLICING IS APPROVED, THE REINFORCEMENT BARS SHALL BE LAPPED FOR A LENGTH OF AT LEAST 36 DIAMETERS (48 DIAMETERS FOR SPIRAL BARS) AND SHALL BE SECURELY WIRED TOGETHER.
6. LENGTH OF BARS SHOWN IN TABLE ALREADY CONSIDER BENDS. DIMENSIONS DESCRIBED IN BAR SHAPES TABLE ARE OUT-TO-OUT OF BAR.
7. CONCRETE VOLUMES SHOWN IN TABLE ARE FOR A 6'-0" HIGH PEDESTAL OR 6'-0" HIGH BARRIER PEDESTAL.
8. LENGTH OF B-1, P-1 AND P-2 BARS SHOWN IN TABLE ARE FOR A 6'-0" HIGH PEDESTAL OR 6'-0" HIGH BARRIER PEDESTAL.
9. WEIGHT SHOWN IN TABLE FOR P-1 BARS IS FOR ONE BAR ONLY.

THIS PLATE FOR DESIGN INFORMATION ONLY. DO NOT INCLUDE IN CONTRACT PLANS.

SIGN STRUCTURE DRG. CA-G4

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

OVERHEAD SIGN SUPPORT STANDARDS

GENERAL INFORMATION

SCALE : NONE

BRIDGE SHEET NO. OF

4/5

BDC02D-03 - ORIGINAL SHEET

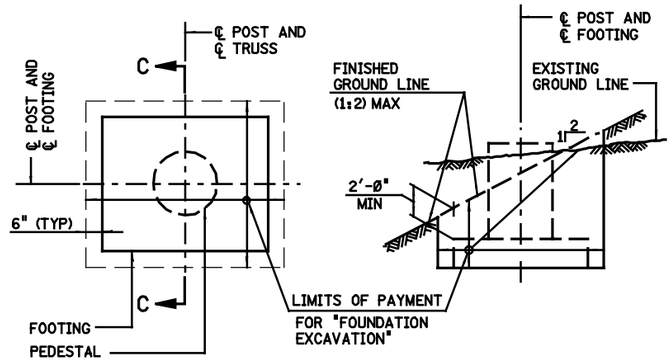
SPREAD FOOTINGS			PILE FOOTINGS					FOOTING REINFORCEMENT				
SIZE FL×FW	CONCRETE VOLUME	EXCAV* VOLUME	CONCRETE VOLUME	EXCAV** VOLUME	No. OF PILES IN ROW "X" LONG	"Y" TRANS	TOTAL	No. AND SIZE OF BARS				TOTAL WEIGHT
	(C.Y.)	(C.Y.)	(C.Y.)	(C.Y.)			No.	FLB	FWB	FLT	FWT	(LBS)
11′-6"X8′	6.8	33.3	8.5	35.4	4	3	12	10-#16	8-#16	6-#16	8-#16	317.5
12′-6"X8′	7.4	36.0	9.3	38.2	4	3	12	13-#16	9-#16	6-#16	9-#16	385.2
13′X8′	7.7	37.3	9.6	39.6	4	3	12	10-#19	9-#16	6-#19	9-#16	455.3
13′X9′	8.7	41.5	10.8	44.1	4	3	12	12-#19	9-#16	7-#19	9-#16	528.2
14′X9′	9.3	44.4	11.7	47.2	4	3	12	14-#19	10-#16	7-#19	10-#16	610.7
14′X10′	10.4	48.9	13.0	51.9	4	3	12	15-#19	10-#16	7-#19	10-#16	648.4
15′X10′	11.1	52.1	13.9	55.3	4	3	12	17-#19	11-#16	7-#19	11-#16	738.6
15′X10′-6"	11.7	54.5	14.6	57.9	4	4	16	19-#19	14-#16	8-#19	11-#16	854.7
15′-6"X10′-6"	12.1	56.2	15.1	59.7	4	4	16	15-#22	11-#19	8-#22	11-#19	1,058.7
16′-6""X10′-6"	12.8	59.6	15.3	63.3	4	4	16	17-#22	12-#19	8-#22	12-#19	1194.0
16′-6"X11′-6"	14.1	64.8	17.6	68.8	4	4	16	19-#22	13-#19	8-#22	12-#19	1306.0
17′X11′-6"	14.5	66.7	18.1	70.8	4	4	16	17-#25	13-#19	8-#25	12-#19	1,546.5
17′X12′-6"	15.7	72.0	19.7	76.5	4	4	16	18-#25	15-#19	9-#25	12-#19	1,703.5
18′X12′-6"	16.7	76.0	20.8	80.7	4	4	16	20-#25	15-#19	9-#25	13-#19	1,875.3
18′X13′	17.3	78.8	21.7	83.7	4	4	16	20-#25	17-#19	9-#25	13-#19	1,948.2
19′X13′	18.3	83.0	22.9	88.1	5	4	20	22-#25	17-#19	9-#25	13-#19	2,110.7

*SPREAD FOOTING EXCAVATION VOLUME BASED ON 8′-0" TOTAL DEPTH OF EXCAVATION.

**PILE FOOTING EXCAVATION VOLUME BASED ON 8′-6" TOTAL DEPTH OF EXCAVATION.

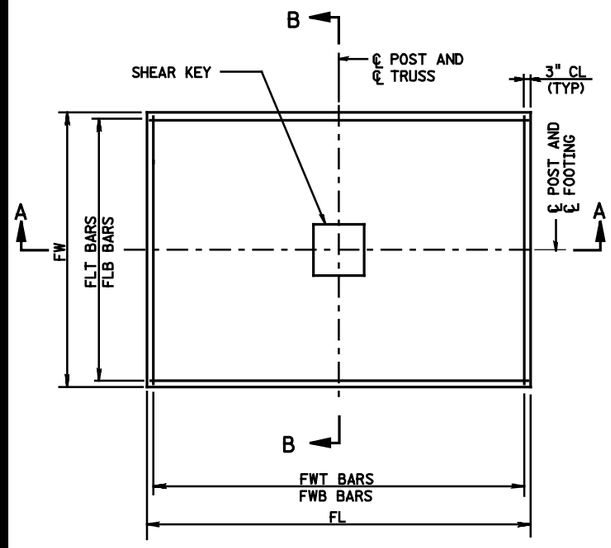
LEGEND:

FL : FOOTING LENGTH
FW : FOOTING WIDTH
FLB : No. AND SIZE OF BOTTOM BARS IN DIRECTION FL
FWB : No. AND SIZE OF BOTTOM BARS IN DIRECTION FW
FLT : No. AND SIZE OF TOP BARS IN DIRECTION FL
FWT : No. AND SIZE OF TOP BARS IN DIRECTION FW
PD : PEDESTAL DIAMETER
BWT : BARRIER WIDTH AT TOP

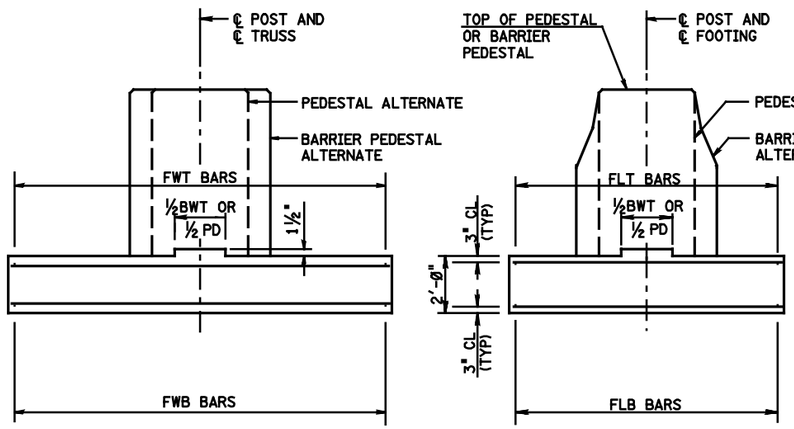


PLAN SECTION C-C

FOOTING EXCAVATION DETAILS

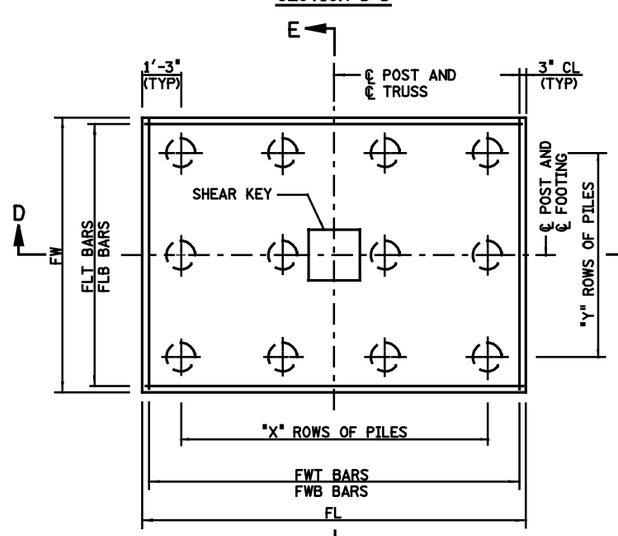


PLAN



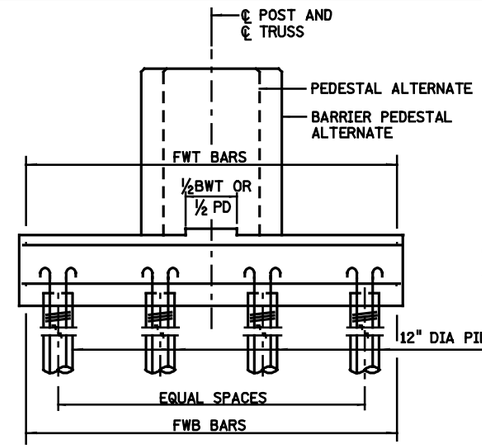
SECTION A-A SECTION B-B

SPREAD FOOTING DETAILS

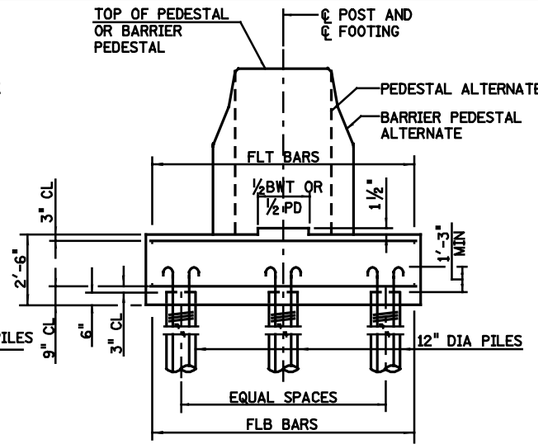


PLAN

PILE FOOTING DETAILS



SECTION D-D



SECTION E-E

NOTES:

1. FOR GENERAL NOTES, SEE SIGN STRUCTURE DRG. CA-G1.
2. FOR FOOTING DIMENSIONS, SEE DESIGN TABLES ON SIGN STRUCTURE DRG. CA-G3.
3. BARS SHALL NOT BE SPLICED EXCEPT AS PROVIDED ON THIS DRAWING OR AUTHORIZED BY THE ENGINEER. WHEN SPLICING IS APPROVED, THE REINFORCEMENT BARS SHALL BE LAPPED FOR A LENGTH OF AT LEAST 36 DIAMETERS AND SHALL BE SECURELY WIRED TOGETHER.
4. PILES SHALL BE CAST-IN-PLACE CONCRETE PILES WITH A MINIMUM BEARING CAPACITY EQUAL TO 50 KSI.
5. PILE DESIGN SHALL CONFORM TO AASHTO SPECIFICATIONS FOR THE SEISMIC DESIGN OF HIGHWAY BRIDGES, SEISMIC PERFORMANCE CATEGORY B, SUBSECTION 6.3.1(C).
6. THE CASING OF THE CAST-IN-PLACE CONCRETE PILES SHALL BE LEFT IN PLACE AND SHALL BE DESIGNED TO RESIST BOTH DIRECT COMPRESSION AND BENDING. THE THICKNESS OF THE CASING SHALL BE NOT LESS THAN 3/16".
7. THE LONGITUDINAL REINFORCING STEEL OF THE CAST-IN-PLACE CONCRETE PILES SHALL BE A MINIMUM OF 6-#16 BARS AND SHALL EXTEND THROUGH THE UPPER THIRD OF THE PILE OR 15′-0" DOWN INTO THE CASING, WHICHEVER IS GREATER, EMBEDDED INTO THE FOOTING WITH STANDARD HOOKS AS SHOWN.
8. THE SPIRAL REINFORCING FOR THE CAST-IN-PLACE CONCRETE PILES SHALL BE #13 BARS AND SHALL EXTEND THROUGH THE UPPER THIRD OF THE PILE OR 15′-0" DOWN FROM THE TOP OF THE CASING.
9. ALTERNATE FOUNDATION DESIGNS MAY BE CONSIDERED BY THE DESIGNER WHERE APPROPRIATE. LOADS FOR THE DESIGN OF NON-STANDARD FOUNDATIONS ARE AVAILABLE FROM THE BUREAU OF STRUCTURAL ENGINEERING.

THIS PLATE FOR DESIGN INFORMATION ONLY. DO NOT INCLUDE IN CONTRACT PLANS.

SIGN STRUCTURE DRG. CA-G5

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

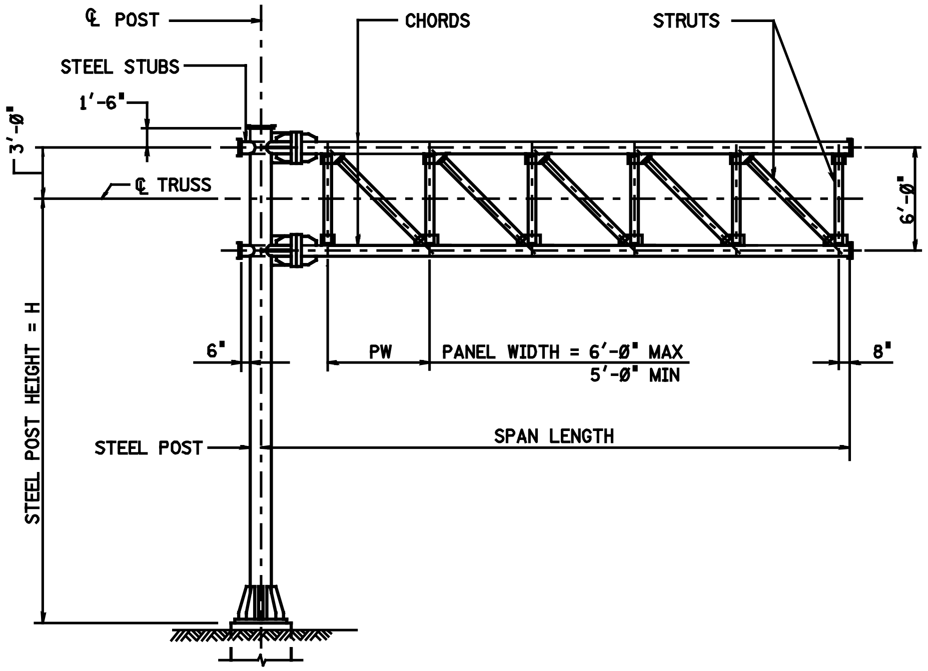
CANTILEVER SIGN SUPPORT STANDARDS

FOOTING DESIGN TABLES AND DETAILS

SCALE : NONE

BRIDGE SHEET NO. OF

5
5



ELEVATION - TYPICAL CANTILEVER SIGN SUPPORT

(LOOKING UPSTATION)

SUMMARY OF QUANTITIES

PAY ITEM NO.	STANDARD ITEM NO.	DESCRIPTION	UNIT	CONTRACT QUANTITY
		CLEARING SITE, STRUCTURE	LUMP SUM	
		FOUNDATION EXCAVATION	C.Y.	
		TEMPORARY SHEETING	S.F.	
		CONCRETE IN STRUCTURES, FOOTINGS	C.Y.	
		REINFORCEMENT STEEL IN STRUCTURES	LB	

GENERAL NOTES

A. DESIGN CRITERIA

DESIGN SPECIFICATIONS

1996 AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES (16TH EDITION) AS MODIFIED BY SECTION 3 AND SECTION 32 OF THE CURRENT NJDOT DESIGN MANUAL - BRIDGES AND STRUCTURES, AND 1994 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS.

DESIGN LOADS

DESIGN WIND VELOCITY ---- 80 MPH
DESIGN ICE LOAD ----------- 3 PSF

SEISMIC LOADS FOR SEISMIC PERFORMANCE CATEGORY (SPC) B, A=0.18, SOIL PROFILE IV (REF. 1996 AASHTO, DIVISION 1A).

FATIGUE LOADS

ALL STRUCTURAL DETAILS HAVE BEEN DESIGNED FOR FATIGUE RESISTANCE UNDER THE FOLLOWING FATIGUE LOADS:

1) NATURAL WIND GUSTS: P_{nw} = 5.2Cd (PSF),
WHERE Cd IS THE DRAG COEFFICIENT SPECIFIED IN SECTION 1.2.5 OF THE 1994 STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS. NATURAL WIND GUST PRESSURE RANGE APPLIED IN THE HORIZONTAL DIRECTION TO THE AREA PROJECTED ON A VERTICAL PLANE OF ALL SUPPORT STRUCTURE MEMBERS, SIGN PANELS AND WALKWAYS.

2) TRUCK-INDUCED GUSTS: P_{tg} = 36.6Cd (PSF),
WHERE Cd IS THE DRAG COEFFICIENT SPECIFIED IN SECTION 1.2.5 OF THE 1994 STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS. TRUCK GUST PRESSURE RANGE APPLIED IN THE UPWARD VERTICAL DIRECTION ALONG THE FULL LENGTH OF THE TRUSS SPAN TO THE AREA PROJECTED ON A HORIZONTAL PLANE OF ALL SUPPORT STRUCTURE MEMBERS, SIGN PANELS, AND WALKWAYS.

VARIABLE MESSAGE SIGN (VMS) STRUCTURES

REFER TO SECTION 32 OF THE NJDOT DESIGN MANUAL - BRIDGES AND STRUCTURES WHEN FURNISHING SUPPORT STRUCTURES FOR VARIABLE MESSAGE SIGNS (VMS).

CONCRETE DESIGN STRESSES

SPECIFIED COMPRESSIVE STRENGTH (f'c) (CLASS B) ---- 3,000 PSI
EXTREME FIBER COMPRESSIVE STRESS (fc) ----------- 1,200 PSI

REINFORCEMENT STEEL DESIGN STRESS

TENSILE STRESS (fs) (A615, GRADE 60) ---- 24 KSI

STRUCTURAL STEEL DESIGN STRENGTHS

YIELD STRENGTH (Fy)
PIPES (A53, TYPE S OR TYPE E, GRADE B) ---- 35 KSI (MIN.)
---- 51 KSI (MAX.)

FOUNDATIONS

MAXIMUM FOUNDATION BEARING PRESSURE ---- 2.5 KSF
FOOTINGS ARE DESIGNED SUCH THAT A MINIMUM OF 75 PERCENT OF THE FOOTING IS ALWAYS IN CONTACT; A MAXIMUM OF 25 PERCENT OF THE FOOTING IS IN UPLIFT.

BEARING PILES SHALL BE CAST-IN-PLACE CONCRETE PILES WITH A MINIMUM BEARING CAPACITY EQUAL TO 50 KIPS.

CAMBER

PERMANENT CAMBER EQUAL TO L/1000 HAS BEEN PROVIDED IN ADDITION TO THE DEAD LOAD CAMBER.

B. MATERIALS

I. STEEL

STEEL PIPE SHALL BE CERTIFIED BY MILL TEST REPORT TO MEET ASTM SPECIFICATION A53, TYPE E OR S, GRADE B WITH THE EXCEPTION THAT API 5L, GRADE B MAY BE USED WHEN THE SPECIFIED WALL THICKNESS IS GREATER THAN ½". ONLY ELECTRICAL RESISTANCE WELDED (ERW) MANUFACTURED SINGLE SEAM PIPE IS PERMITTED. HOWEVER, WHEN THE REQUIRED PIPE SIZE IS GREATER THAN 24", DOUBLE SEAM PIPE MAY BE USED. A MILL TEST REPORT MUST BE PROVIDED, CERTIFIED AND SIGNED BY THE PIPE MANUFACTURER, CONTAINING PHYSICAL AND CHEMICAL PROPERTIES AND THE MANUFACTURING PROCESS USED TO PRODUCE THE PIPE.

ALL OTHER STEEL SHALL CONFORM TO ASTM SPECIFICATION A36 GRADE 36 OR AASHTO M270 GRADE 50 (ASTM A709). ALL THIS SPECIFICATION STEEL SHALL MEET SUPPLEMENTARY REQUIREMENTS FOR NOTCH TOUGHNESS (CHARPY TESTING, ZONE #2)

REFER TO SUBSECTION 509.02 OF THE NJDOT STANDARD SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

UPON COMPLETION OF FABRICATION, THE FABRICATOR SHALL PROVIDE A NOTARIZED CERTIFICATION OF COMPLIANCE AS PER SECTION 106.04 OF THE NJDOT STANDARD SPECIFICATIONS, INCLUDING A LEGIBLE COPY OF ALL MILL TEST REPORTS FOR MATERIALS INCORPORATED INTO THE WORK.

STEEL ANCHOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM SPECIFICATION F1554, GRADE 36. THE ANCHOR BOLTS SHALL BE HOT DIP GALVANIZED AS PER ASTM SPECIFICATION A153, CLASS C.

CHORD SPLICE ASSEMBLY FASTENERS SHALL BE HIGH STRENGTH STEEL CONFORMING TO ASTM SPECIFICATION A325 AND SHALL BE HOT DIP GALVANIZED AS PER ASTM SPECIFICATION A153, CLASS C. ALL OTHER FASTENERS SHALL BE STAINLESS STEEL CONFORMING TO ASTM SPECIFICATION A320, GRADE B8, CLASS 1.

CAPS FOR THE ENDS OF CHORDS AND TOPS OF POSTS SHALL BE STEEL CONFORMING TO ASTM SPECIFICATION A36 AND SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM SPECIFICATION A123.

WELDING OF STEEL SHALL BE AS SPECIFIED IN THE CONSTRUCTION SPECIFICATIONS.

AFTER COMPLETE FABRICATION, EACH STEEL SECTION SHALL BE HOT DIP GALVANIZED ACCORDING TO THE REQUIREMENTS OF ASTM SPECIFICATION A123, AS MODIFIED BY THE CONSTRUCTION SPECIFICATIONS. A SINGLE DIP GALVANIZING PROCESS IS PREFERRED IF SIZE PERMITS.

II. ALUMINUM

ALUMINUM SHALL CONFORM TO THE ASTM SPECIFICATIONS AND ALLOYS LISTED BELOW:

APPLICATION	ASTM SPECIFICATION	ASTM ALLOY
ROLLED OR EXTRUDED SHAPES	B308	6061 - T6
PLATES	B209	6061 - T6
DRAWN SEAMLESS TUBES	B210	6061 - T6
EXTRUDED TUBES	B221	6061 - T6

WELDING OF ALUMINUM SHALL BE AS SPECIFIED IN THE CONSTRUCTION SPECIFICATIONS.

THE SIGN PANEL SHALL BE INSTALLED LEVEL. THE CONTRACTOR SHALL FIELD DRILL THE SIGN SUPPORTS AS REQUIRED TO ACHIEVE THIS.

III. REINFORCEMENT STEEL

ALL REINFORCEMENT STEEL SHALL BE ASTM A615, GRADE 60.

IV. CONCRETE

ALL CONCRETE SHALL BE "CONCRETE IN STRUCTURES, FOOTINGS", UNLESS OTHERWISE SPECIFIED BY THE DESIGNER.

INDEX OF DRAWINGS

CONTROL SECTION	________	JOB NO. ________	
DES. BY		CHK. BY	
DWN. BY			
EST. BY		CHK. BY	
SPECS. BY			
IN CHARGE OF ________			

SIGN STRUCTURE DRG. CA-D1

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

CANTILEVER SIGN SUPPORT STRUCTURES
GENERAL NOTES AND ELEVATION

ROUTE: SECTION:

SCALE : NONE

BRIDGE SHEET NO. OF

STATE	FEDERAL PROJECT NO.
N.J.	

CANTILEVER SIGN SUPPORTS - SCHEDULE OF STRUCTURES

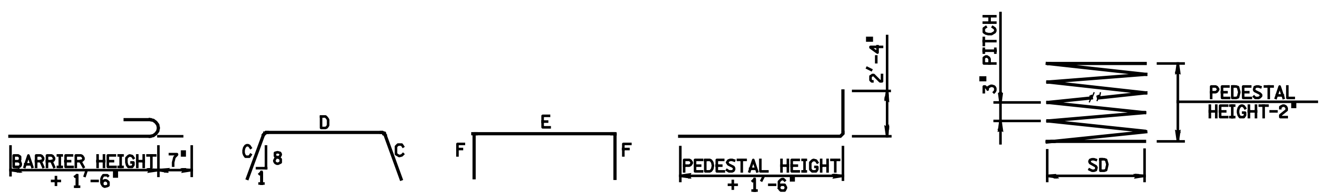
SIGN SUPPORTS – STRUCTURE No.	SIGN SUPPORTS – GO Nos.	SIGN SUPPORTS – STATION	ELEVATIONS – ℄ TRUSS	ELEVATIONS – BOTTOM OF BASE PLATE	SPAN LENGTH (FT)	PANEL WIDTH PW (FT)	STEEL TRUSS – CHORDS O.D.xTHICK (IN)	STEEL TRUSS – STRUTS O.D.xTHICK (IN)	STEEL TRUSS – STEEL STUBS O.D.xTHICK (IN)	STEEL TRUSS – CAMBER (IN)	STEEL POST – H = 25 FT O.D.xTHICK (IN)	STEEL POST – H = 30 FT O.D.xTHICK (IN)	STEEL POST – H = 40 FT O.D.xTHICK (IN)

NOTE:

ALL ELEVATIONS SHALL BE VERIFIED IN THE FIELD PRIOR TO FABRICATION AND CONSTRUCTION.

CANTILEVER SIGN SUPPORTS - SCHEDULE OF FOUNDATIONS

STRUCTURE No.	FOOTING – SIZE FLxFW (FT)	FOOTING – ELEV BOT OF FTG (FT)	FOOTING – VOLUME – CONCRETE – WITH PILES (C.Y.)	FOOTING – VOLUME – CONCRETE – W/O PILES (C.Y.)	FOOTING – VOLUME – EXCAVATION – WITH PILES (C.Y.)	FOOTING – VOLUME – EXCAVATION – W/O PILES (C.Y.)	FOOTING – No. OF PILES IN ROW – "X"	FOOTING – No. OF PILES IN ROW – "Y"	FOOTING – PILE LGTH (FT)	FOOTING – REINFORCING BARS No. & SIZE – FLB	FOOTING – REINFORCING BARS No. & SIZE – FWB	FOOTING – REINFORCING BARS No. & SIZE – FLT	FOOTING – REINFORCING BARS No. & SIZE – FWT	FOOTING – WT OF RE-BARS (LBS)	PEDESTAL – SIZE PD (IN)	PEDESTAL – PED HT (FT)	PEDESTAL – ELEV TOP OF PED (FT)	PEDESTAL – VOL OF CONC (C.Y.)	PEDESTAL – VERT REBARS TYPE "P-1" – No. & SIZE	PEDESTAL – VERT REBARS TYPE "P-1" – A	PEDESTAL – VERT REBARS TYPE "P-1" – LGTH	PEDESTAL – SPIRAL REBARS TYPE "P-2" – No. & SIZE	PEDESTAL – SPIRAL REBARS TYPE "P-2" – SD (IN)	PEDESTAL – SPIRAL REBARS TYPE "P-2" – LGTH	PEDESTAL – WT OF COR. PROT. RE-BARS (LBS)	BARRIER PEDESTAL – SIZE BWT (FT)	BARRIER PEDESTAL – BAR-RIER HT (FT)	BARRIER PEDESTAL – ELEV TOP OF BARR (FT)	BARRIER PEDESTAL – VOL OF CONC (C.Y.)	BARRIER PEDESTAL – VERT REBARS TYPE "P-1" – No. & SIZE	BARRIER PEDESTAL – VERT REBARS TYPE "P-1" – LGTH	BARRIER PEDESTAL – SPIRAL REBARS TYPE "P-2" – No. & SIZE	BARRIER PEDESTAL – SPIRAL REBARS TYPE "P-2" – SD (IN)	BARRIER PEDESTAL – SPIRAL REBARS TYPE "P-2" – LGTH	BARRIER PEDESTAL – STANDARD BARRIER REBARS TYPE "B-1" – No. & SIZE	BARRIER PEDESTAL – STANDARD BARRIER REBARS TYPE "B-1" – LGTH	BARRIER PEDESTAL – STANDARD BARRIER REBARS TYPE "B-2" – No. & SIZE	BARRIER PEDESTAL – STANDARD BARRIER REBARS TYPE "B-2" – D (IN)	BARRIER PEDESTAL – STANDARD BARRIER REBARS TYPE "B-2" – C (IN)	BARRIER PEDESTAL – STANDARD BARRIER REBARS TYPE "B-2" – LGTH	BARRIER PEDESTAL – STANDARD BARRIER REBARS TYPE "B-3" – No. & SIZE	BARRIER PEDESTAL – STANDARD BARRIER REBARS TYPE "B-3" – E (IN)	BARRIER PEDESTAL – STANDARD BARRIER REBARS TYPE "B-3" – F (IN)	BARRIER PEDESTAL – STANDARD BARRIER REBARS TYPE "B-3" – LGTH	BARRIER PEDESTAL – WT OF COR. PROT. RE-BARS (LBS)	TOTAL WT OF COR. PROT. RE-BARS (LBS)	TOTAL WEIGHT OF ALL REBAR TYPES (LBS)	TOTAL VOLUME OF CONC (C.Y.)



TYPE "B-1" TYPE "B-2" TYPE "B-3" TYPE "P-1" TYPE "P-2"

REBAR SHAPES

CONTROL SECTION	________	JOB NO. ________
DES. BY		CHK. BY
DWN. BY		
EST. BY		CHK. BY
SPECS. BY		
IN CHARGE OF ________		

BDC02D-03 - ORIGINAL SHEET

SIGN STRUCTURE DRG. CA-D2

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

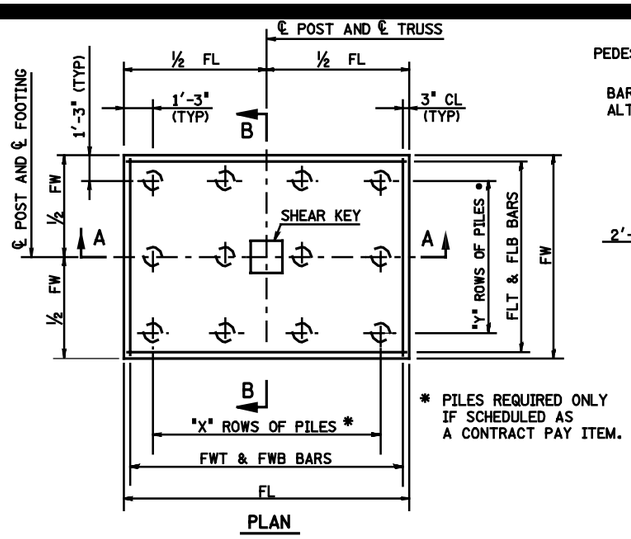
CANTILEVER SIGN SUPPORT STRUCTURES
STRUCTURE AND FOUNDATION SCHEDULES

ROUTE: SECTION:

SCALE : NONE

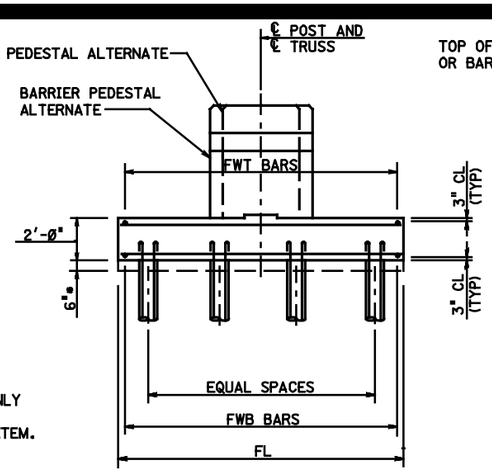
BRIDGE SHEET NO. OF

STATE	FEDERAL PROJECT NO.
N.J.	

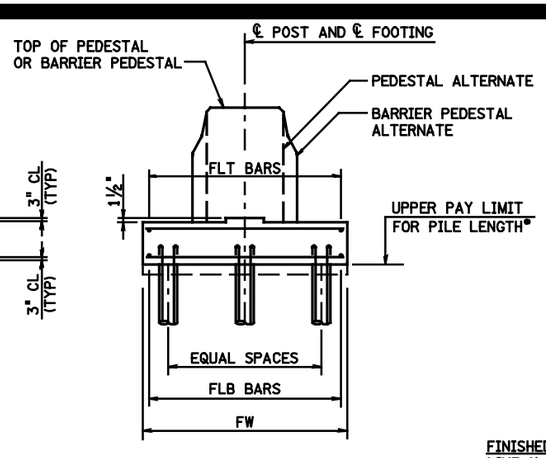


* PILES REQUIRED ONLY IF SCHEDULED AS A CONTRACT PAY ITEM.

PLAN

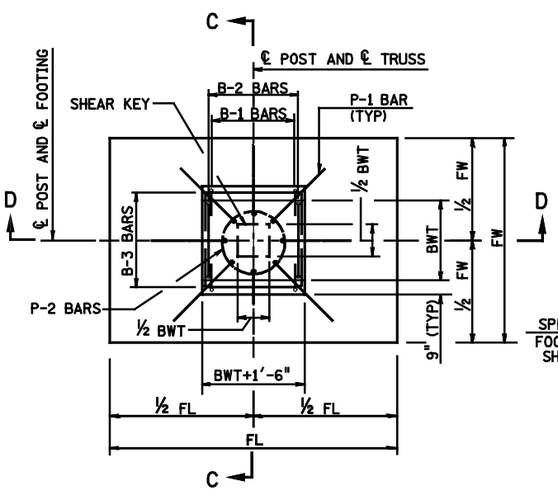


SECTION A-A



SECTION B-B

FOOTING



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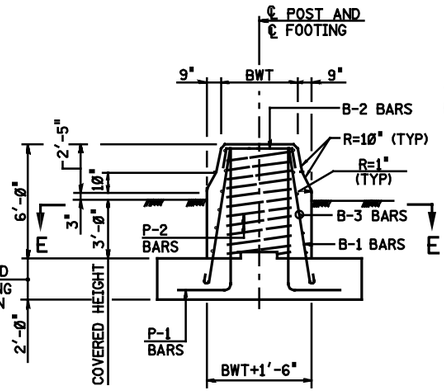
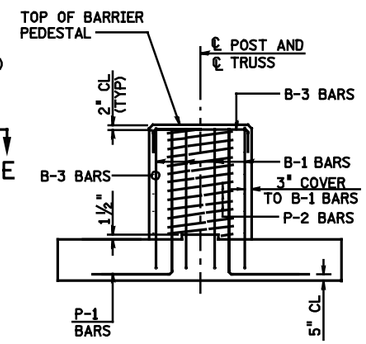
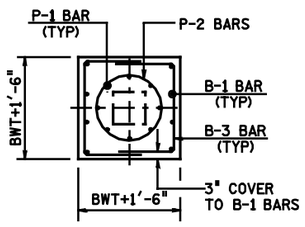


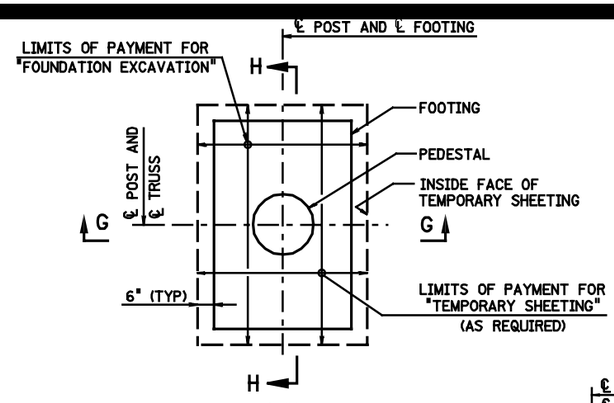
SECTION C-C



SECTION D-D



SECTION E-E



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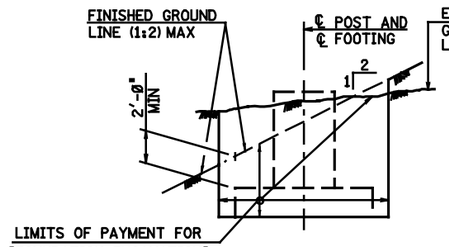
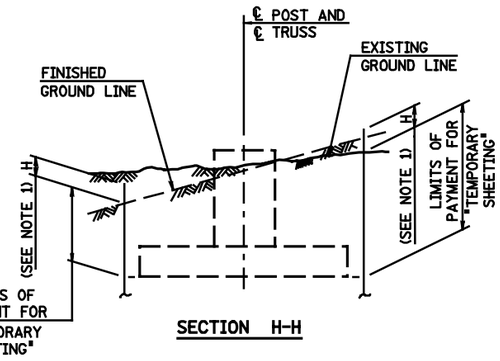


SECTION G-G



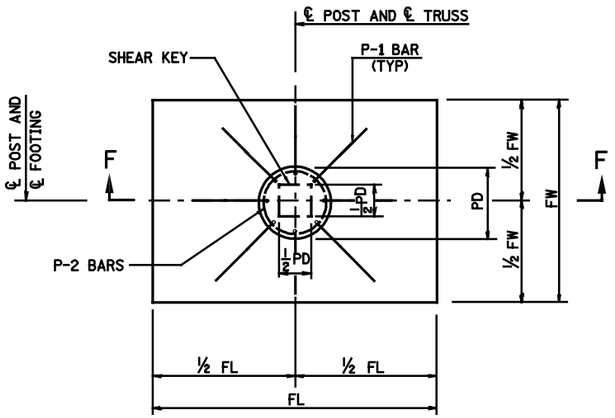
SECTION H-H

TEMPORARY SHEETING AND EXCAVATION DETAILS

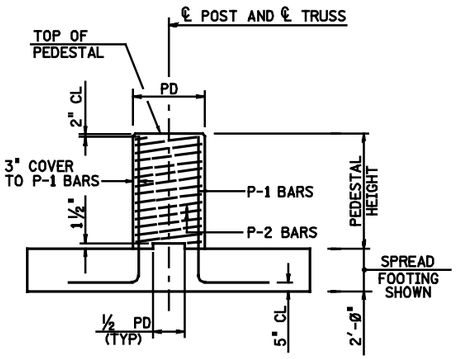
NOTES:

1. WHEN TEMPORARY SHEETING IS REQUIRED, H IS 3'-Ø" WHEN ADJACENT TO PEDESTRIAN OR VEHICULAR TRAFFIC AND 1'-Ø" MINIMUM FOR ALL OTHER CONDITIONS.
2. PAYMENT LIMITS FOR TEMPORARY SHEETING SHALL BE MEASURED FROM THE FINISHED GRADE LINE OR FROM THE EXISTING GROUND LINE, WHICHEVER IS LOWER.
3. EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 1"X1" UNLESS NOTED OTHERWISE.
4. BARS SHALL NOT BE SPLICED EXCEPT AS PROVIDED ON THIS DRAWING OR AUTHORIZED BY THE ENGINEER. WHEN SPLICING IS APPROVED, THE REINFORCEMENT BARS SHALL BE LAPPED FOR A LENGTH OF AT LEAST 36 DIAMETERS (48 DIAMETERS FOR SPIRAL BARS) AND SHALL BE SECURELY WIRED TOGETHER.
5. FOR DETAILS OF CAST-IN-PLACE CONCRETE PILES, SEE SIGN STRUCTURE DRG. CA-D6.
6. ALL REINFORCEMENT IN PEDESTALS AND BARRIER PEDESTALS SHALL BE CORROSION PROTECTED.

BARRIER PEDESTAL



PLAN



SECTION F-F

PEDESTAL

SIGN STRUCTURE DRG. CA-D3

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

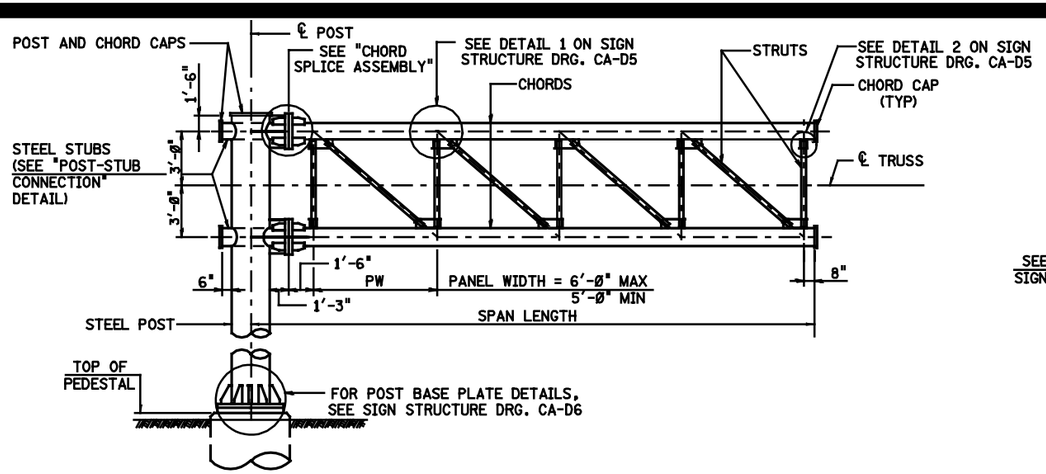
CANTILEVER SIGN SUPPORT STRUCTURES FOUNDATION DETAILS

ROUTE: SECTION:

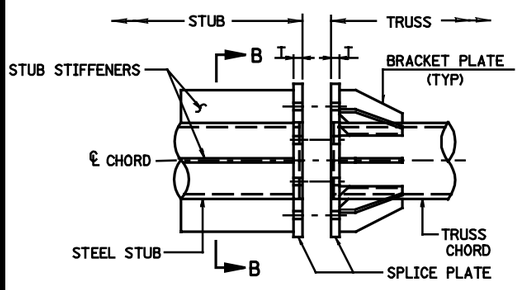
SCALE : NONE

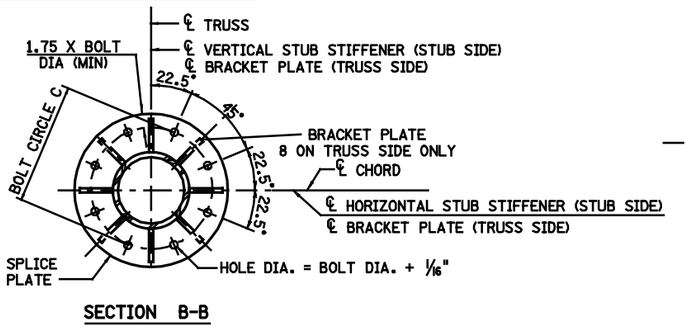
BRIDGE SHEET NO. OF

BRDGD_03 - ORIGINAL SHEET



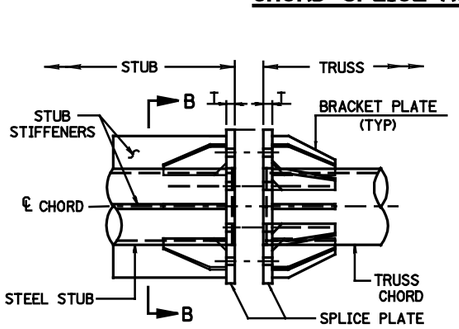
ELEVATION -TYPICAL CANTILEVER SIGN SUPPORT

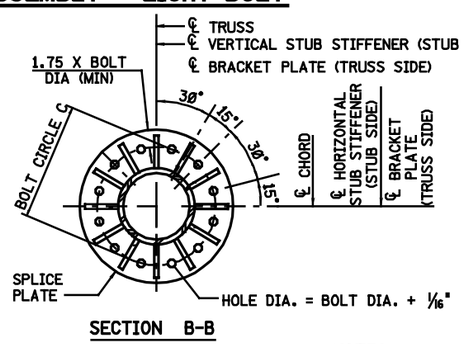




SECTION B-B

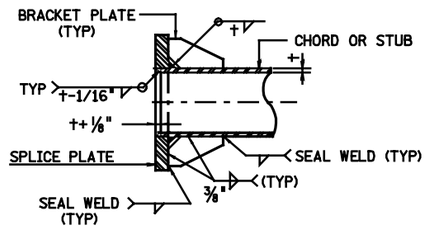
CHORD SPLICE ASSEMBLY - EIGHT-BOLT

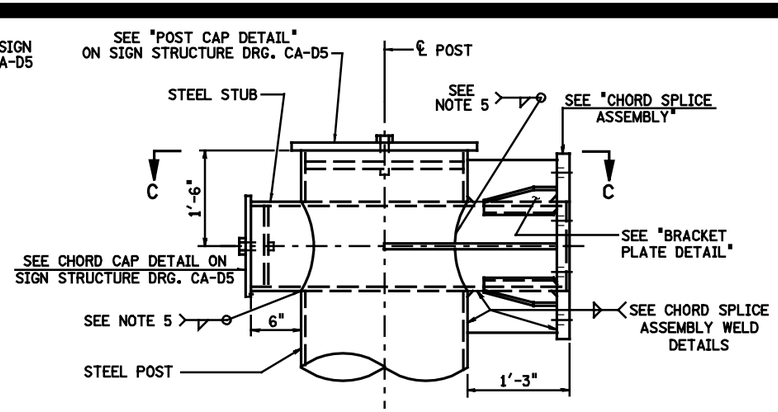




SECTION B-B

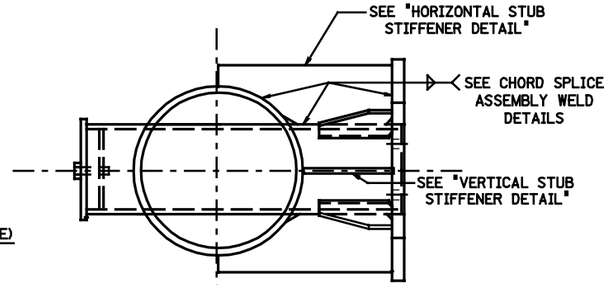
CHORD SPLICE ASSEMBLY WELD DETAIL



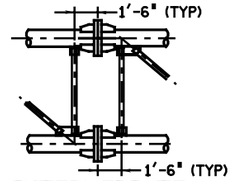


POST-STUB CONNECTION

(TWELVE-BOLT SPLICE SHOWN)

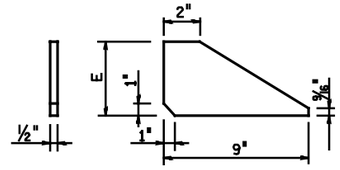


SECTION C - C

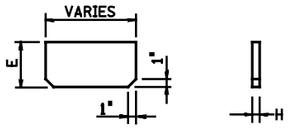


INTERMEDIATE SPLICE DETAIL

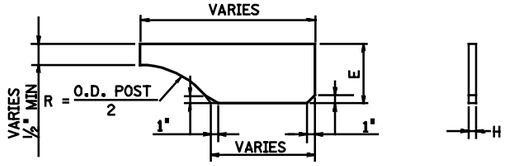
(SEE NOTE No. 4)



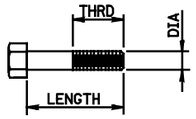
BRACKET PLATE DETAIL



VERTICAL STUB STIFFENER DETAIL



HORIZONTAL STUB STIFFENER DETAIL



SPLICE BOLT DETAIL

(A325)

TRUSS CHORD SPLICE ASSEMBLY

CHORD O.D.xTHICK (IN)	SPLICE PLATES THICKNESS T (IN)	STUB STIFFENER PLATES E (IN)	STUB STIFFENER PLATES H (IN)	SPLICE BOLTS No. OF BOLTS	SPLICE BOLTS BOLT CIRCLE C (IN)	SPLICE BOLTS DIAMETER (IN)	SPLICE BOLTS BOLT TENSION (KIPS)
8.625x.322	1 1/2	4 3/4	5/8	8	16	1	51.0
8.625x.500	1 1/2	4 3/4	5/8	8	16	1	51.0
12.750x.375	1 1/2	6 1/2	5/8	12	23	1 1/8	56.0
12.750x.500	1 1/2	6 1/2	5/8	12	23	1 1/8	56.0
18.000x.375	2 1/4	6	5/8	12	27	1 1/2	103.0
18.0002x.500	2 1/4	6	3/4	12	27	1 1/2	103.0

NOTES:

1. HOLE SIZE H INDICATED IN TABLES IS THE DRILLED FULL SIZE AS PER AASHTO 11.4.8 (DIVISION II).
2. A325 SPLICE BOLTS SHALL BE HEAVY HEXAGON TYPE AND SHALL BE FURNISHED WITH HEAVY HEXAGON NUTS AND WASHERS.
3. THE THREADED PORTION OF THE SPLICE BOLTS SHALL BE EXCLUDED FROM THE SHEAR PLANE OF THE SPLICE.
4. CHORD INTERMEDIATE SPLICING WILL NOT BE PERMITTED UNLESS AUTHORIZED BY THE ENGINEER. WHEN INTERMEDIATE SPLICING IS AUTHORIZED, THE SPLICE SHALL BE AS SHOWN ON THE INTERMEDIATE SPLICE DETAIL AND AS PER CHORD SPLICE ASSEMBLY TABLE ON THIS PLATE.
5. IF FILLET WELD SIZE IS NOT SHOWN ON DETAILS, THE WELD SIZE SHALL BE THE SAME AS THE THICKNESS OF THE THINNER PART BEING JOINED.
6. FOR THE OUTSIDE DIAMETER (O.D.) OF THE STEEL STUB PIPE SEE SCHEDULE OF STRUCTURES ON SIGN STRUCTURE DRG. CA-D2.
7. THE PROVISIONS OF SUBSECTION 509.09 OF THE NJDOT STANDARD SPECIFICATIONS SHALL BE FOLLOWED IN FURNISHING THE REQUIRED SPLICE ASSEMBLY.
8. REFER TO SUBSECTION 509.08 OF THE NJDOT STANDARD SPECIFICATIONS FOR THE SPLICE BOLT TIGHTENING PROCEDURES. WHEN CALIBRATED WRENCHES ARE USED FOR BOLT INSTALLATION, THEY SHALL BE SET TO PROVIDE A TENSION THAT IS SPECIFIED IN THE TABLE ABOVE.
9. HORIZONTAL AND VERTICAL STUB STIFFENER PLATE DIMENSIONS MAY BE VARIED TO ACCOUNT FOR CAMBER (SEE CAMBER DETAIL ON SIGN STRUCTURE DRG. CA-D5).

STATE: N.J. | FEDERAL PROJECT NO.:

SIGN STRUCTURE DRG. CA-D4

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

CANTILEVER SIGN SUPPORT STRUCTURES TRUSS AND POST DETAILS - SHEET 1

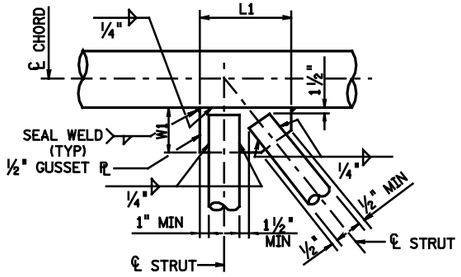
ROUTE: SECTION:

SCALE : NONE

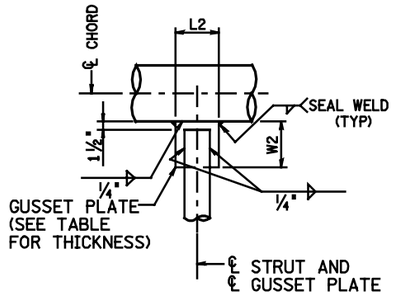
BRIDGE SHEET NO. OF

BOARD 03 ORIGINAL SHEET

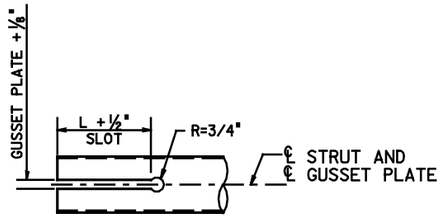
STATE	FEDERAL PROJECT NO.
N.J.	



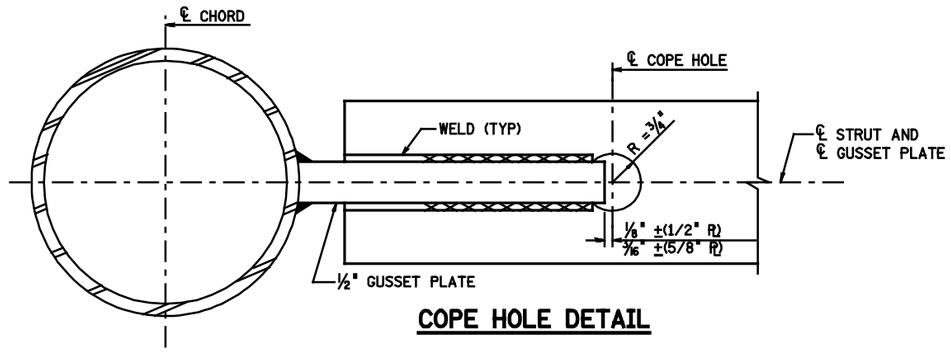
DETAIL 1
('K' GUSSET)



DETAIL 2
('T' GUSSET)



DETAIL A

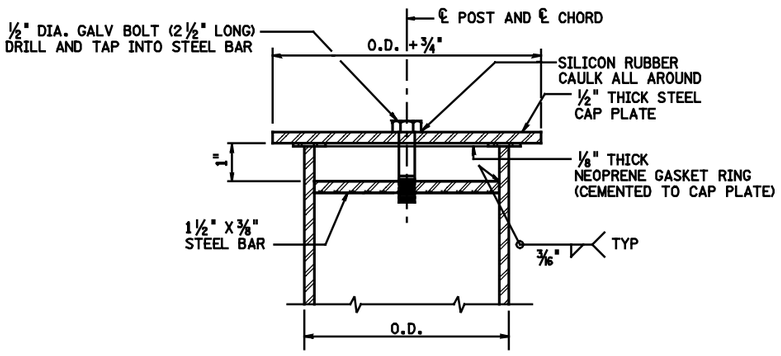


COPE HOLE DETAIL

NOTE:
COPE HOLES TO BE PROVIDED AT BOTH ENDS AND BOTH FACES OF ALL STRUTS.

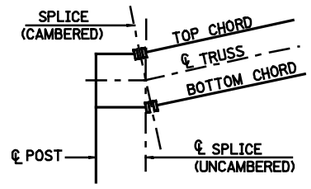
TRUSS GUSSET PLATES

CHORD O.D.xTHICK (IN)	'K' GUSSET (1/2" THICK)		'T' GUSSET		
	L1 (IN)	W1 (IN)	L2 (IN)	W2 (IN)	THICKNESS (IN)
8.625X.322	13	6¼	5⅛	6¼	½
8.625X.500	14	6¼	5⅛	6¼	½
12.750X.375	16	7	6¼	7	½
12.750X.500	19	7¼	9	7¼	½
18.000X.375	21	8¼	10	8¼	½
18.000X.500	24	9	14⅝	9	⅝

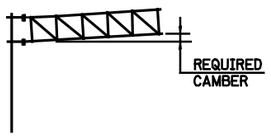


POST OR CHORD CAP DETAIL

NOTE: ALTERNATE CAP DETAILS MAY BE SUBMITTED TO THE ENGINEER FOR APPROVAL.



CAMBER DETAIL



CAMBER DIAGRAM

CAMBER NOTE:

CAMBER SHALL BE OBTAINED BY SHORTENING THE TOP CHORD STUB LENGTH AND LENGTHENING THE BOTTOM CHORD STUB LENGTH. CHORD SPLICE PLATES SHALL BE SKEWED ACCORDINGLY BEFORE WELDING TO CHORDS. NO FORCE SHALL BE APPLIED IN PROVIDING CAMBER. AN ALTERNATE METHOD OF OBTAINING CAMBER MAY BE USED AS APPROVED BY THE ENGINEER. FOR REQUIRED CAMBER, SEE SCHEDULE OF STRUCTURES ON SIGN STRUCTURE DRG. CA-D2.

SIGN STRUCTURE DRG. CA-D5

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

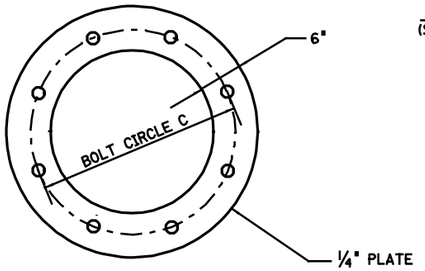
CANTILEVER SIGN SUPPORT STRUCTURES TRUSS AND POST DETAILS - SHEET 2

ROUTE: SECTION:

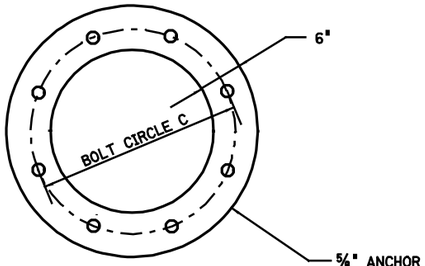
SCALE : NONE

BRIDGE SHEET NO. OF

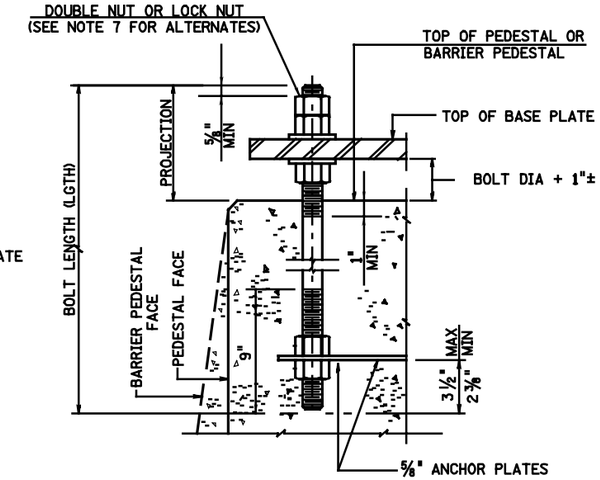
BRIDGE 03 - ORIGINAL SHEET



TEMPLATE PLATE DETAIL



ANCHOR PLATE DETAIL

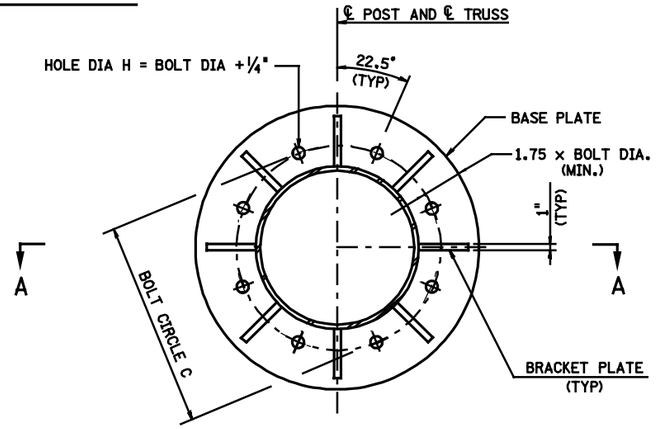


ANCHOR BOLT DETAIL

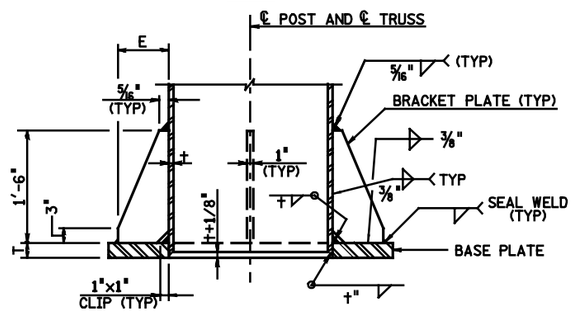
POST SHAFT BASE ASSEMBLY

POST O.D.xTHICK (IN)	BASE PLATE THICKNESS T (IN)	BRACKET PLATES E (IN)	ANCHOR BOLTS BOLT CIRCLE C (IN)	ANCHOR BOLTS SIZE DIAxLGTH (IN)	ANCHOR BOLTS BOLT TENSION (KIPS)	ANCHOR BOLTS PROJ• (IN)
14.000X.500	1¾	6¾	22	2 X 53	101.5	9½
16.000X.500	1¾	7	24	2¼X 57	131.9	10
18.000X.500	1¾	7	26	2¼X 57	131.9	10
20.000X.500	2	7½	28	2½X 63	146.8	11
22.000X.500	2	8	30	2½X 67	162.4	12
24.000X.500	2	8½	32	2¾X 72	200.2	12⅜
26.000X.500	2¼	9	36	2¾X 72	200.2	12¾
26.000X.625	2¼	9⅛	36	3 X 77	242.4	13
26.000X.750	2½	9½	36	3¼X 82	264.8	13½
26.000X.875	2¾	11	36	3¼X 82	264.8	13½

• PROJECTION LENGTH SHOWN IS BASED ON USING DOUBLE NUTS.

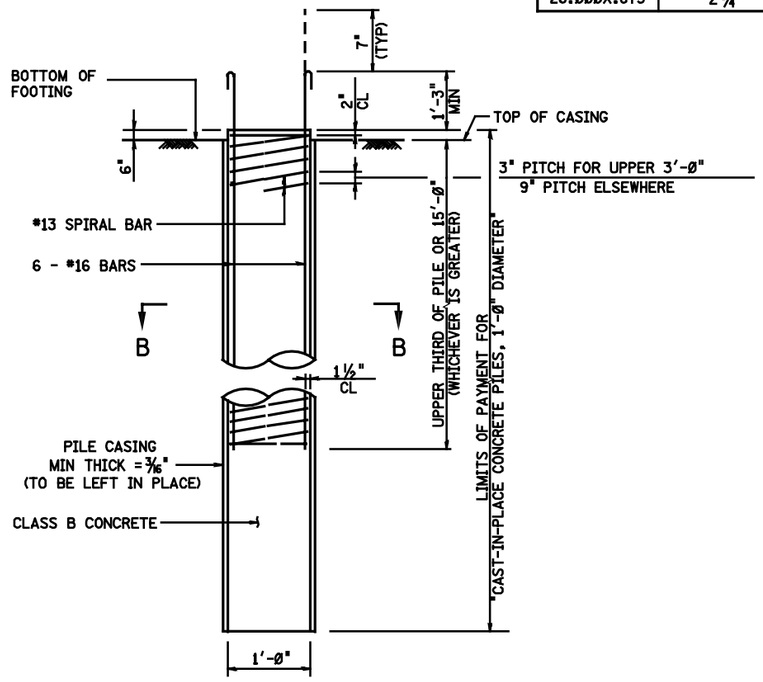


PLAN

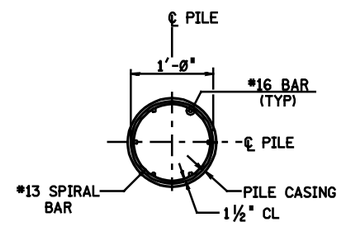


SECTION A-A

POST BASE PLATE DETAIL



ELEVATION



SECTION B-B

CAST-IN-PLACE CONCRETE PILE

NOTES:

1. BEARING PILES SHALL BE CAST-IN-PLACE CONCRETE PILES. ALL PILES SHALL BE 1'-Ø" IN DIAMETER OR EQUIVALENT AND SHALL HAVE A MINIMUM BEARING CAPACITY OF 50 KIPS. THE NUMBER AND SPACING OF PILES SHALL BE AS INDICATED ON SIGN STRUCTURE DRG. CA-D3.
2. PILE DESIGN SHALL CONFORM TO AASHTO SPECIFICATIONS FOR THE SEISMIC DESIGN OF HIGHWAY BRIDGES, SEISMIC PERFORMANCE CATEGORY B, SUBSECTION 6.3.1 (C).
3. APPROVED METAL SPACERS SHALL BE ATTACHED TO THE TOP AND BOTTOM SPIRALS TO ENSURE THAT THE REQUIRED CLEAR DISTANCE TO THE CASING IS MAINTAINED.
4. NO CONCRETE SHALL BE PLACED IN CAST-IN-PLACE PILES UNTIL AFTER ALL PILE CASINGS FOR THE FOOTING HAVE BEEN DRIVEN.
5. ANCHOR BOLTS SHALL BE PROVIDED WITH FOUR HEAVY HEXAGON NUTS AND TWO WASHERS AS SHOWN ON THE ANCHOR BOLT DETAIL.
6. ANCHOR BOLTS SHALL BE GALVANIZED AFTER THREADING.
7. REFER TO SUBSECTION 509.08 OF THE NJDOT STANDARD SPECIFICATIONS FOR ANCHOR BOLT TIGHTENING PROCEDURES. WHEN CALIBRATED WRENCHES ARE USED FOR BOLT INSTALLATION, THEY SHALL BE SET TO PROVIDE THE TENSION THAT IS SPECIFIED IN THE TABLE ABOVE.
8. TEMPLATE PLATE WITH NUTS ON BOTH SIDES SHALL BE USED TO MAINTAIN THE SPACING AND ALIGNMENT OF ANCHOR RODS.

STATE	FEDERAL PROJECT NO.
N.J.	

SIGN STRUCTURE DRG. CA-D6

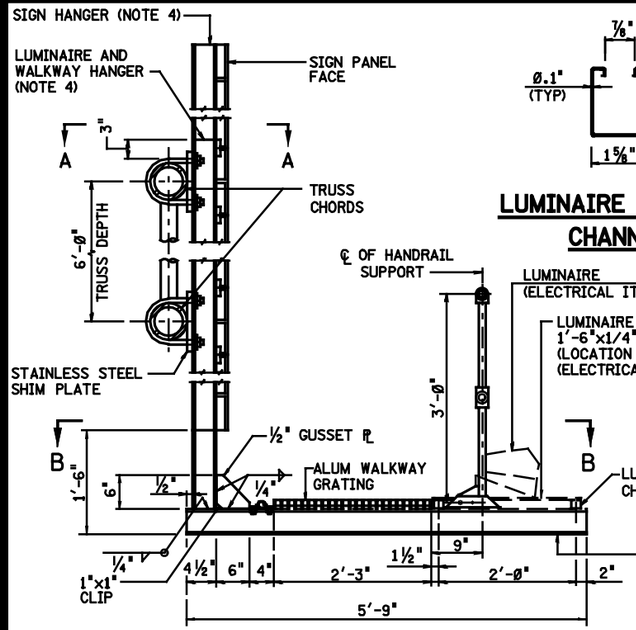
NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

CANTILEVER SIGN SUPPORT STRUCTURES POST BASE AND FOUNDATION DETAILS

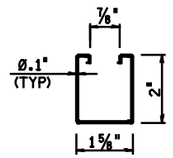
ROUTE: SECTION:

SCALE : NONE

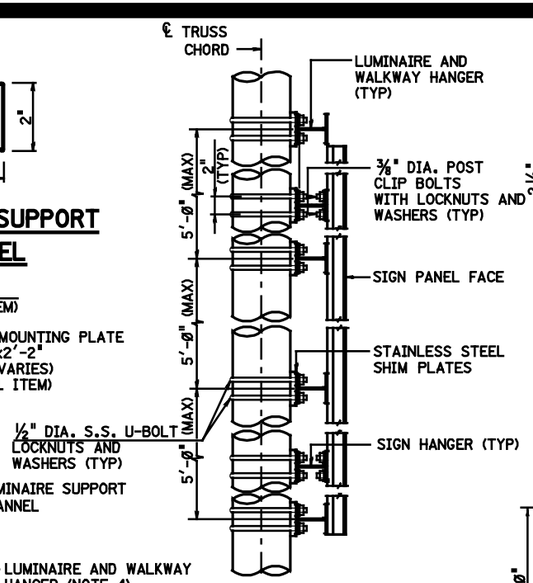
BRIDGE
SHEET NO. OF



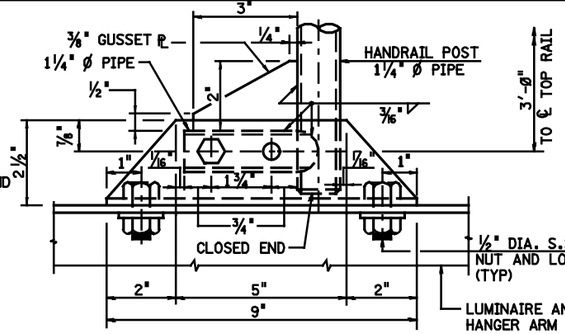
TYPICAL MAINTENANCE WALKWAY DETAIL



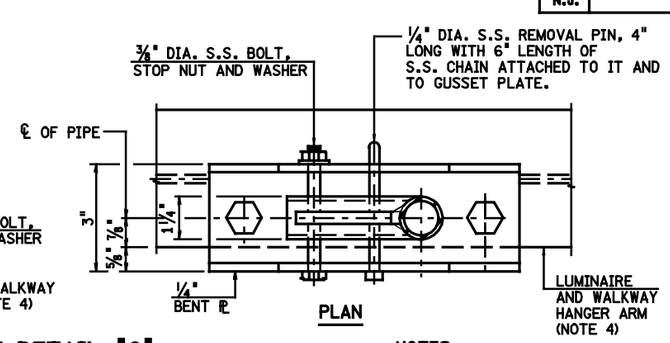
LUMINAIRE SUPPORT CHANNEL



SECTION A-A

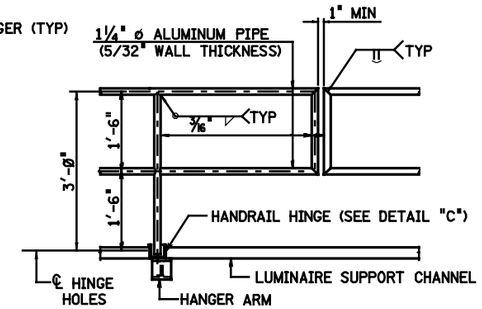


ELEVATION

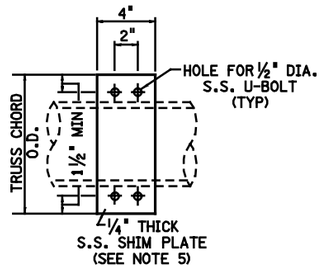


PLAN

HANDRAIL HINGE DETAIL "C"



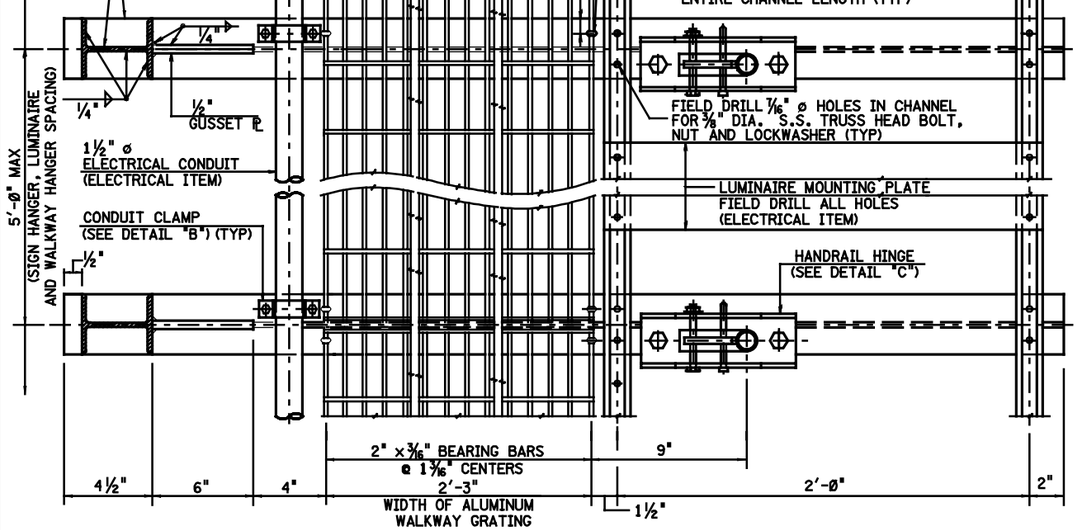
ELEVATION OF HANDRAIL



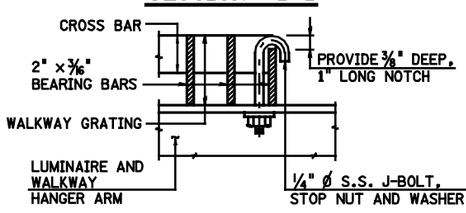
SHIM PLATE DETAIL

NOTES

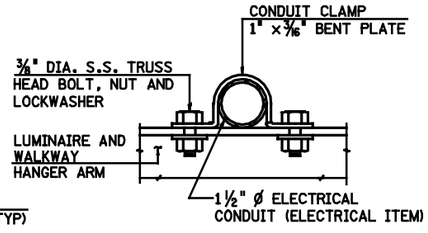
1. ALL MATERIAL SHALL BE ALUMINUM ALLOY 6061-T6 UNLESS OTHERWISE NOTED.
2. ALL SHIM PLATES, BOLTS, U-BOLTS, WASHERS AND NUTS SHALL BE STAINLESS STEEL CONFORMING TO ASTM SPECIFICATION A320 GRADE B8, CLASS 1.
3. WELDING OF ALUMINUM SHALL BE AS SPECIFIED IN THE CONSTRUCTION SPECIFICATIONS.
4. ALUMINUM I-BEAM (DEPTH = 4", WEB AND FLANGE THICKNESS = ¼", FLANGE WIDTH = 3½"). SIGN HANGER SPACING DESIGNED FOR 15'-0" MAXIMUM SIGN PANEL HEIGHT.
5. IF INTERMEDIATE TRUSS CHORD SPLICES ARE USED, THE THICKNESSES OF SHIM PLATES MUST BE INCREASED TO AVOID INTERFERENCE BETWEEN THE CHORD SPLICE PLATES AND THE SIGN PANELS.
6. MAINTENANCE WALKWAY, RAILING AND LUMINAIRE SUPPORTS SHALL BE PROVIDED CONTINUOUSLY FOR THE ENTIRE SIGN DESIGN LENGTH UNLESS OTHERWISE SHOWN.
7. MINIMUM SECTION MODULUS OF ALUMINUM WALKWAY GRATING SHALL BE 1.35 CU. IN. PER FOOT WIDTH. WALKWAY GRATING SHALL NOT CANTILEVER MORE THAN 1'-0" BEYOND HANGER ARMS AT EACH END OF THE MAIN WALKWAY. WALKWAY GRATING SHALL BE CONTINUOUS OVER A MINIMUM OF TWO SPANS.
8. ALTERNATE PIPE FITTINGS FOR HANDRAIL MAY BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
9. ALL PIPES FOR HANDRAIL SHALL BE 1¼" NOMINAL DIA. WITH ⅜" WALL THICKNESS.
10. MAXIMUM LENGTH OF HANDRAIL SECTION SHALL BE 10'-0" AND SHALL INCLUDE TWO POSTS.
11. ALTERNATE HANDRAIL HINGE DETAILS MAY BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
12. LUMINAIRE AND WALKWAY HANGERS SHALL PROJECT 3" ABOVE THE TOP OF THE TOP CHORD AND SHALL NOT SUPPORT SIGN PANELS.
13. LENGTH OF SIGN HANGERS SHALL BE EQUAL TO THE SIGN PANEL HEIGHT.
14. SIGN HANGERS SHALL BE USED TO SUPPORT SIGN PANELS ONLY.
15. EXIT PANEL CONNECTION DETAIL SHOWN SHALL ALSO BE USED FOR THE ATTACHMENT OF NEW EXIT PANELS TO EXISTING SIGN PANELS.
16. SIGN PANELS SHALL NOT EXTEND MORE THAN 3'- 0" BEYOND THE LAST SIGN HANGER. MAINTENANCE WALKWAYS SHALL NOT NOT EXTEND MORE THAN 1'- 0" BEYOND THE LAST WALKWAY HANGER.



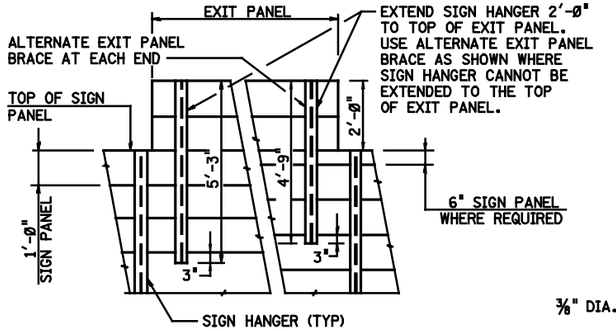
SECTION B-B



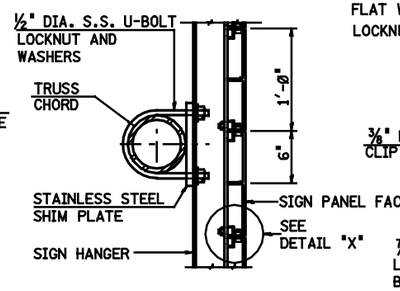
DETAIL "A"



DETAIL "B"

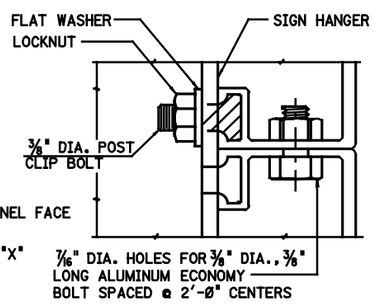


EXIT PANEL CONNECTION DETAIL

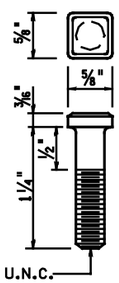


SIGN PANEL CONNECTION DETAIL

POST CLIP BOLT



DETAIL "X"



STATE N.J. | FEDERAL PROJECT NO.

SIGN STRUCTURE DRG. CA-D7

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

CANTILEVER SIGN SUPPORT STRUCTURES MAINTENANCE WALKWAY DETAILS

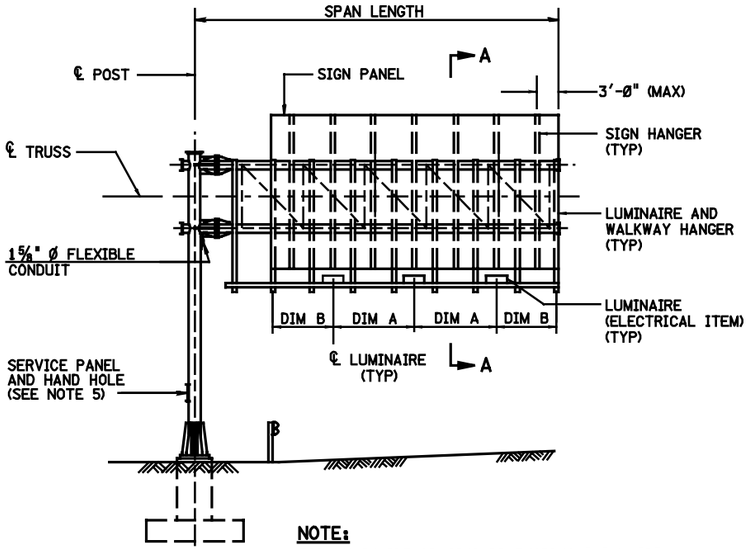
ROUTE: SECTION:

SCALE : NONE

BRIDGE SHEET NO. OF

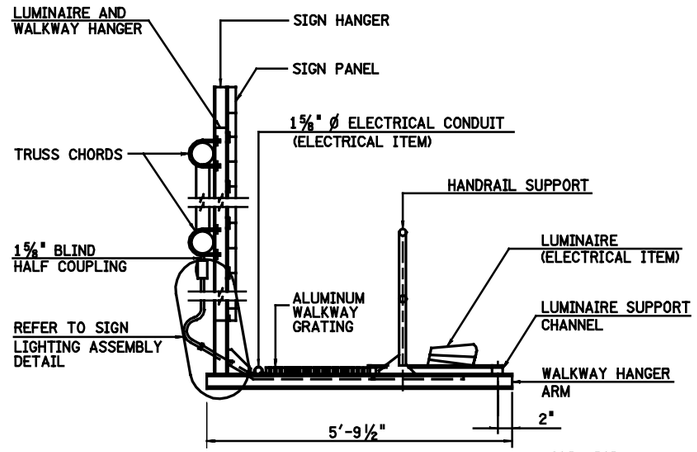
BDC98-03 ORIGINAL SHEET

STATE	FEDERAL PROJECT NO.
N.J.	

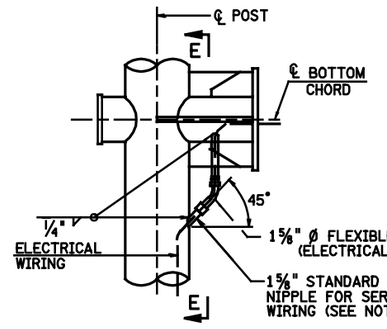


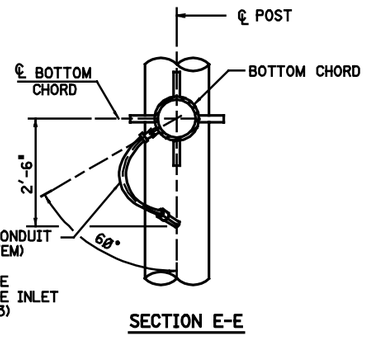
NOTE:
FOR LUMINAIRE SPACING DIMENSIONS "A" & "B" SEE SIGN LIGHTING ASSEMBLY DETAIL.

ELEVATION - TYPICAL CANTILEVER SIGN SUPPORT



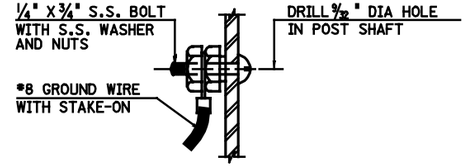
SECTION A-A



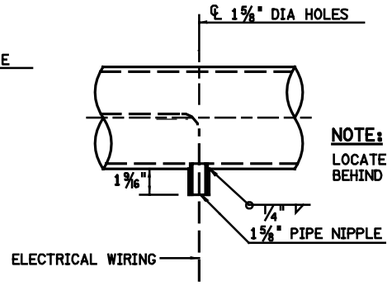


SECTION E-E

DETAILS OF WIRE OUTLETS

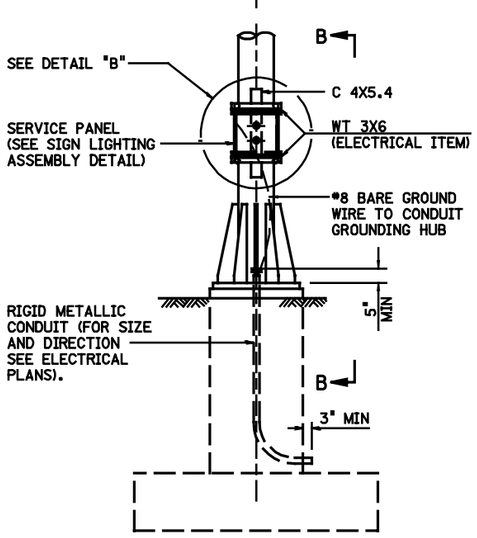


GROUND STUD

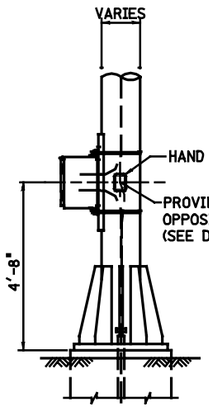


NOTE:
LOCATE (1) ONE WIRE OUTLET BEHIND EACH SIGN PANEL

DETAIL OF WIRE OUTLET ON TUBE

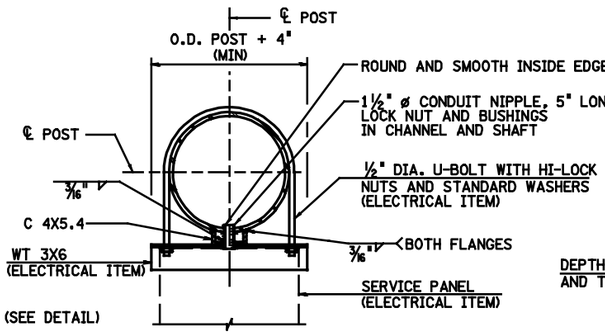


SIDE ELEVATION

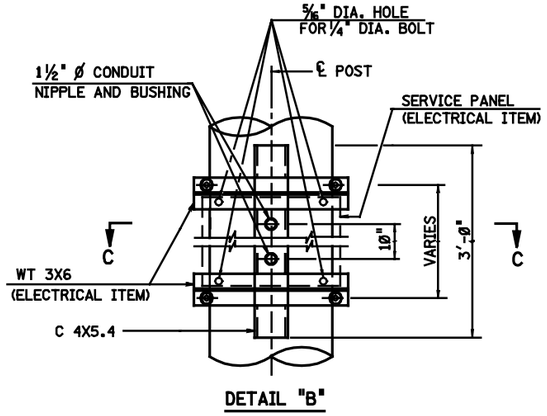


SECTION B-B

NOTE:
HAND HOLE AND GROUND STUD TO BE PROVIDED IN STEEL POST AT LOCATION OF RIGID METALLIC CONDUIT (SEE ELECTRICAL PLANS FOR LOCATION).

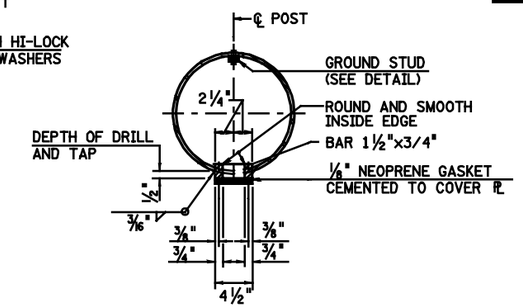


SECTION C-C

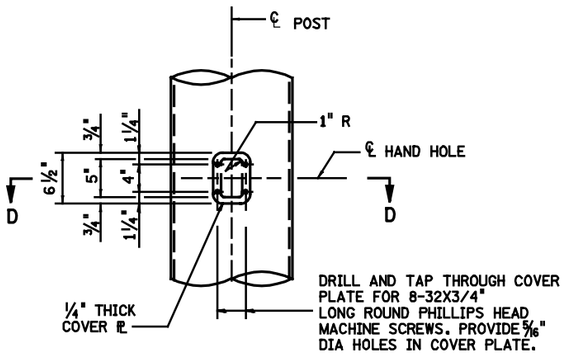


DETAIL "B"

TYPICAL SERVICE PANEL DETAIL AT SIGN STRUCTURE



SECTION D-D



HAND HOLE AND COVER DETAIL

NOTES:

1. WHEN SIGN LIGHTING IS REQUIRED, AN APPROVED SIGN LIGHTING SYSTEM SHALL BE PROVIDED.
2. ALL BOLTS TO BE INSTALLED WITH WASHERS, LOCKWASHERS AND NUTS. ALL HARDWARE SHALL BE STAINLESS STEEL CONFORMING TO ASTM A320, GRADE B8, CLASS 1.
3. 1⅝" STANDARD PIPE NIPPLES SHALL BE OF APPROVED MATERIAL AND BE COMPATIBLE WITH THE MATERIAL TO WHICH THEY ARE WELDED.
4. IF REQUIRED, WALKWAY GRATING AND LUMINAIRE SUPPORT CHANNELS SHALL BE CONTINUOUS FROM HANGER TO HANGER.
5. SEE ELECTRICAL PLANS FOR LOCATION AND DIRECTION OF SERVICE PANEL, RIGID CONDUITS, AND FLEXIBLE CONDUITS.

SIGN STRUCTURE DRG. CA-D8

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

CANTILEVER SIGN SUPPORT STRUCTURES
TYPICAL ELECTRICAL DETAILS

ROUTE: SECTION:

SCALE : NONE

BRIDGE SHEET NO. OF

8/20/03 ORIGINAL SHEET